Engineering and Maintenance

Greetings

Season's

★ ★ ★ AND BEST WISHES FOR THE NEW YEAR!

postponing costly maintenance...

- The powerful reactive force of Reliance Hy-Pressure Hy-Crome Spring Washers is constantly at work to compensate for developed looseness and keep rail joint bolts *tighter longer* despite heavy loads and high speeds.

- Tight joints depreciate slowly, costly rail end welding, reforming and angle bar crowning operations are postponed, cutting maintenance costs.

- A trial test of Reliance Hy-Pressure Hy-Crome Spring Washers on your toughest stretch of track is invited. Contact our sales engineers for further data and details.

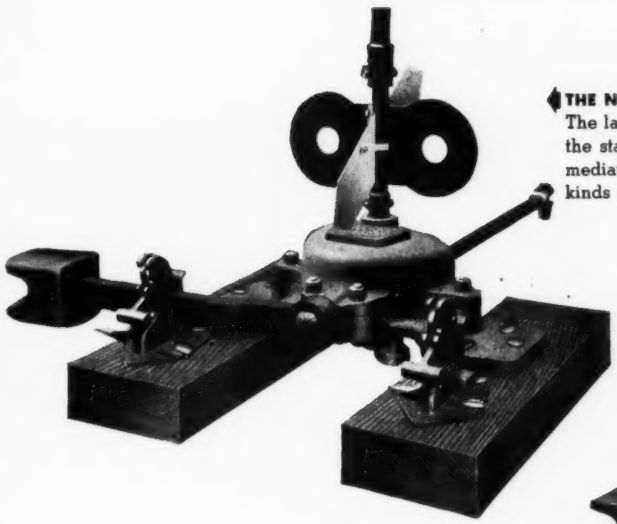
EATON

EATON MANUFACTURING COMPANY

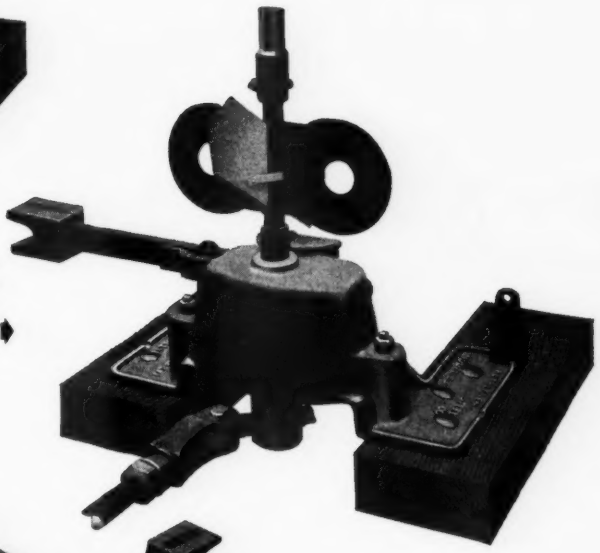
RELIANCE HY-PRESSURE HY-CROME SPRING WASHERS

EATON **RELIANCE DIVISION, MASSILLON, OHIO**

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal



THE NEW CENTURY. Made in two types, Nos. 50 and 51. The latter is adjustable by means of a shim device within the stand itself. Both models available in low and intermediate types. For use with 60-lb rail and over in all kinds of heavy-duty service.



THE MODEL 53. Operates on the sliding-block-and-crank principle. Only three moving parts; virtually nothing to get out of order. Safe, simple, dependable—and very sturdy. Suitable for both main-line and heavy yard duty.

THE MODEL 1222. Another sliding-block type. So low and compact that it is often chosen for confined locations. Excellent in yards and around station platforms; also used in certain kinds of main-line service.

SWITCH STANDS THAT *STAY* GOOD

Plenty of switch stands do a good enough job while they're new. But here are three time-tested Bethlehem models that *stay* good—continue giving safe, reliable service year in, year out. Their basic designs have proved so sound that only minor details have been changed in the long history of these stands.

Ask a Bethlehem man for full information. He'll be glad to explain the particular features and uses of each model.

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

Published monthly by Simmons-Boardman Publishing Corporation 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry pending at Marion, Ind., post office. Address communications to 79 W. Monroe St., Chicago 3, Ill. Volume 45, No. 12.

Faster on those everyday maintenance problems!

A Northwest Crawler Crane can be put on the job faster. It loads and unloads under its own power on a standard flatcar or trailer and it can be used either on the line or off the line, or it will operate from the car itself.

It is convertible from a standard Shovel to a Crane or Dragline by simply changing booms, giving you the choice of the most efficient machine for the problem.

Such features as the Northwest Dual Independent Crowd, that utilizes force other shovels waste; the Cushion Clutch Northwest Uniform Pressure Swing Clutches; Northwest simplicity of design, that makes upkeep easy; and the safety of the "Feather-Touch" Clutch Control, that assures the absolute impossibility of shutdown due to control failure; combine for faster handling of your maintenance-of-way problems from widening right-of-way to trimming banks.

Let us tell you more about it. Northwest does things no track type machine can do.

NORTHWEST ENGINEERING COMPANY
1513 Field Bldg., 135 S. LaSalle St., Chicago 3, Ill.

NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

MORE TRACKAGE TAMPED PER DAY

with BARCO

The fast, powerful blows of a Barco Tytamper enable a man to double his output. Self-contained and portable and light, these economical workers save extra time at congested spots because they work fast, can be moved quickly off the right-of-way. Barco tamps the ballast firmly and uniformly, making it less subject to compression from passing trains. It is not necessary to ride the BARCO tytampers in tamping cemented ballast. For more information on this hard-hitting, economical tool, write today to the Barco Manufacturing Co., 1805G Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO

UNIT TYTAMPERS

FREE ENTERPRISE . . . THE CORNERSTONE OF AMERICAN PROSPERITY

Light-Simple-Effective

RACINE UNIT TIE TAMPER

Saves Labor, Time and Tempers

WHY USERS LIKE RACINE TAMPERS

★ **Light in weight — Less than 60 lbs.**

★ **Patented, special alloy spring assembly throws the hammer and cushions the recoil. No shock on operator. No manual pressure needed to compact ballast.**

★ **1500 high velocity blows per minute, combine with stirring action for fast, effective work in all types of ballast.**

★ **Tamping bars last longer — because they are protected by inherently balanced blow and recoil, and a rubber cushioned tool holder head.**

★ **Maintenance cost is low — extremely simple assembly of few working parts, reduces replacements and repairs below all previous standards.**

Three years of field service prove the RACINE Unit Tamper superior. It is lighter in weight, easier to carry, trouble-free and long-lived.

The unique, patented, special alloy spring assembly, creates a sling-shot like action. All the operating shock is contained within the machine, the operator remains steadily at work without fatigue.

Easy starting in heat or cold. Ready for work within seconds after pulling built-in starter cable. Magneto ignition — no batteries to fail or be lost. Lubricated by oil in gasoline. Fumes exhausted from engine — none through operating mechanism and sliding ways to cause carbon and wear.

Fully guaranteed — performance qualities have been demonstrated by three years of laboratory and field tests as well as continuous use under varying working conditions across the country. Complete information supplied to maintenance men without cost, obligation or high-pressure sales follow-up.

WRITE TODAY FOR INTERESTING CATALOG

STANDARD FOR QUALITY AND PRECISION · RACINE · RACINE TOOL and MACHINE CO.

RACINE TOOL AND MACHINE COMPANY
1738 State St., Racine, Wis.

★STANDARD FOR QUALITY AND PRECISION

For additional information, use postcard, pages 1151-1152

COMPRESSION

Rail Anchors

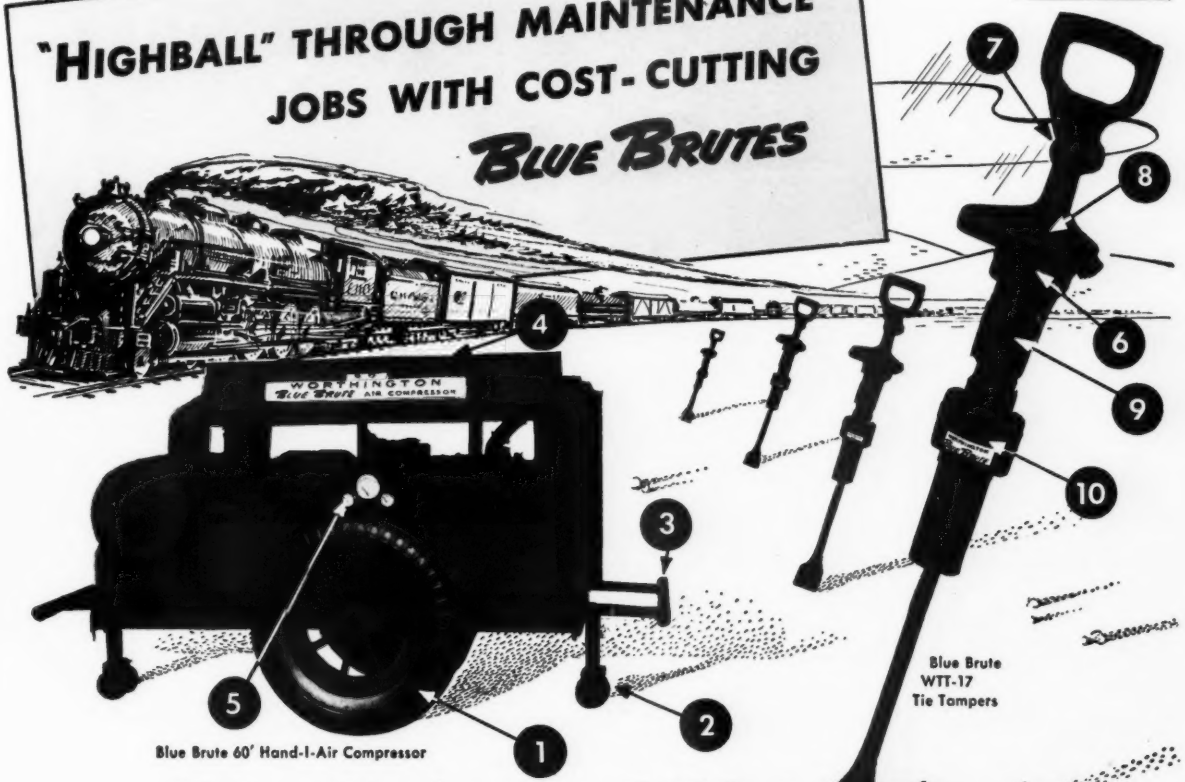
Compression-held track is economical of man-hours. Keep your track firmly held against creepage in EITHER direction. Two-way holding is an important asset in meeting the challenge of fewer maintenance hours.

THE RAILS COMPANY

General Office
178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.

"HIGHBALL" THROUGH MAINTENANCE JOBS WITH COST-CUTTING BLUE BRUTES



Blue Brute 60' Hand-I-Air Compressor

Blue Brute WTT-17 Tie Tampers

...Like this feature-filled track-team

Here's expertly engineered portability that will save you time and dollars on every job. The light, strong Blue Brute Hand-I-Air has ❶ 600x16 pneumatic tires for easy riding over right-of-way shoulders . . . ❷ adjustable dolly wheels for single-rail use . . . ❸ telescoping handle bars that act as bumpers during shipping . . . and ❹ a lifting bale for quick hoisting. In action, there's push-button control . . . Worthington Feather* Valves for continuous, maximum air delivery . . while ❺ the Automatic Fuel Saver regulates engine speed to air consumption, reducing wear, prolonging compressor-life.

You'll hang up high speed surfacing records when you hook up these Blue Brute team-mates – 4 WTT-17 Tie Tampers. Easy-handling 42-pounders, they are packed with hard-slugging power and kept at peak by ❻ foolproof, built-in lubrication which feeds a constant film of oil to piston and cylinders . . . ❼ positive locking throttle control with dust-proof replaceable bushing for low-cost maintenance . . . ❽ replaceable, hardened nickel steel throttle valve bushing providing leak-proof seat . . . ❾ adequate freeze resistant exhaust opening . . . and ❿ independent venting of cylinder, allowing piston hammer to strike harder.

Investigate the many Blue Brute combinations you can team up for faster, better, lower-cost performance on track, bridge and building work. Write for further facts proving there's more worth in a Blue Brute.

Worthington Pump and Machinery Corporation, Worthington Construction Equipment Dept., Harrison, N. J.
Distributors in all principal cities

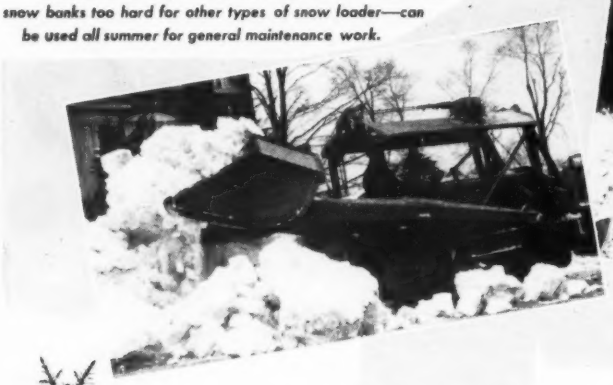
WORTHINGTON

BUY BLUE BRUTES

*Reg. U.S. Pat. Off. H9-e

FOR EVERY CONSTRUCTION AND MAINTENANCE JOB

An Oliver "Cletrac" and Sargent Overhead with snow bucket blocks only one traffic lane while loading—loads snow banks too hard for other types of snow loader—can be used all summer for general maintenance work.



An Oliver 900 Wheel tractor equipped with snow plow is an efficient unit for clearing snow from highways and city streets.

An Oliver "Cletrac" and Heil Dozer form a combination that is as efficient for snow clearing as it is for dirt moving.

take the "worry" out of winter!

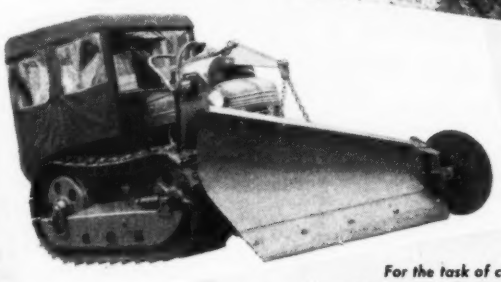
Get the jump on winter with efficient Oliver snow removal equipment.

Both Oliver "Cletrac" crawler tractors and Oliver Industrial wheel tractors and their full line of allied equipment can help you keep highways, streets and sidewalks clear of snow . . . keep traffic moving despite the heaviest snowfall.

And, an important cost-cutting advantage to you is the fact that these husky tractors are year-round units . . . snow plows and snow loaders in winter, earth-movers, loaders, shovels, pavement breakers, mowers, ditch diggers, etc., in other seasons. Why pay for a lot of specialized individual construction and maintenance equipment when Oliver and Oliver "Cletrac" tractors can do the job at far less cost.

If you already own Oliver Tractors, ask your Oliver Distributor about snow removal equipment designed for your tractors. If not, you'll find it pays to investigate the Oliver line today.

An Oliver "Cletrac" and front end loader gets high-piled snow off the street fast and economically.



For the task of clearing snow from sidewalks, driveways or side streets, an Oliver crawler tractor and sidewalk snow plow is the answer.

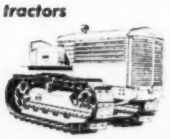
Cletrac

a product of

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of crawler and industrial wheel tractors



OLIVER Cletrac SALES SERVICE

"THE SIGN OF EXTRA SERVICE"

What's the best way...

to cut rail cropping costs

by portable field units? ...or fixed installation?

Both are excellent!... but, many roads find that a centrally located rail cropping plant usually lends itself to a more efficient and economical operation.

With a fixed installation, the work can be set up on a continuous production basis... rails can be collected at a central point, and the road can realize the full capabilities of specialized workmen.

As shown in the accompanying photographs, rail cropping is simple, easy and quick. The Airco developed rail cropping machine employs two highly efficient, oxyacetylene flame cutting tips, which cut rails of any size, making as many as 25 cuts an hour, and producing a surface that requires a minimum of grinding.

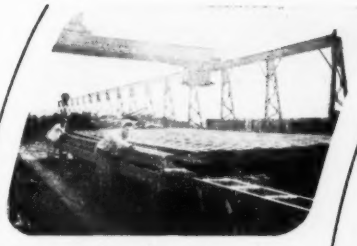
For further information, write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company. On West Coast: Air Reduction Pacific Company.)

COSTS COME DOWN UNDER THE AIRCO PLAN

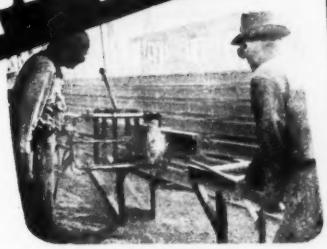
AIRCO **AIR REDUCTION**

Offices in Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories.



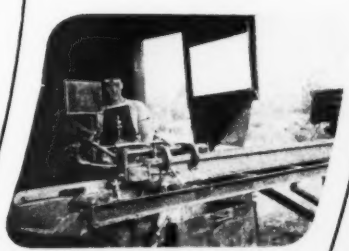
... conveying the rail to the cropping machine.



... making the bottom, or backward, cut. (Note: This machine is portable and can be transported to the right-of-way, if so desired.)

... cropped rail, showing cut quality.

... finishing the cut end.



... drilling bolt holes in rail end.

Mining Gold

FOR THE RAILROADS

When Pullman-Standard Power Track Cribbers start digging . . .

—cribs come clean in seconds . . .

—and track-maintenance costs take a nose dive.

Suppose *we* dig into just one of numerous case histories, and let the results recently reported by a leading railroad system tell their own story . . . of "gold-mining" performance by Pullman-Standard *Power Track Cribbers*.

DATA FILE "X"

CRIBBING WITH POWER TRACK CRIBBER

Type of ballast: hard, cemented rock.
Single-track operation.
Total cribs cleared: 10,108.
Cribs per minute: 1.8.
Time per crib: 32.8 seconds.
Labor cost per crib: 13.8¢.
Labor cost per mile: $430.00.

COMPARISON WITH HAND CRIBBING (estimated)

Labor cost per crib: 61.5¢.
Labor cost per mile: $2,000.00.

SAVING—MACHINE vs. HAND CRIBBING

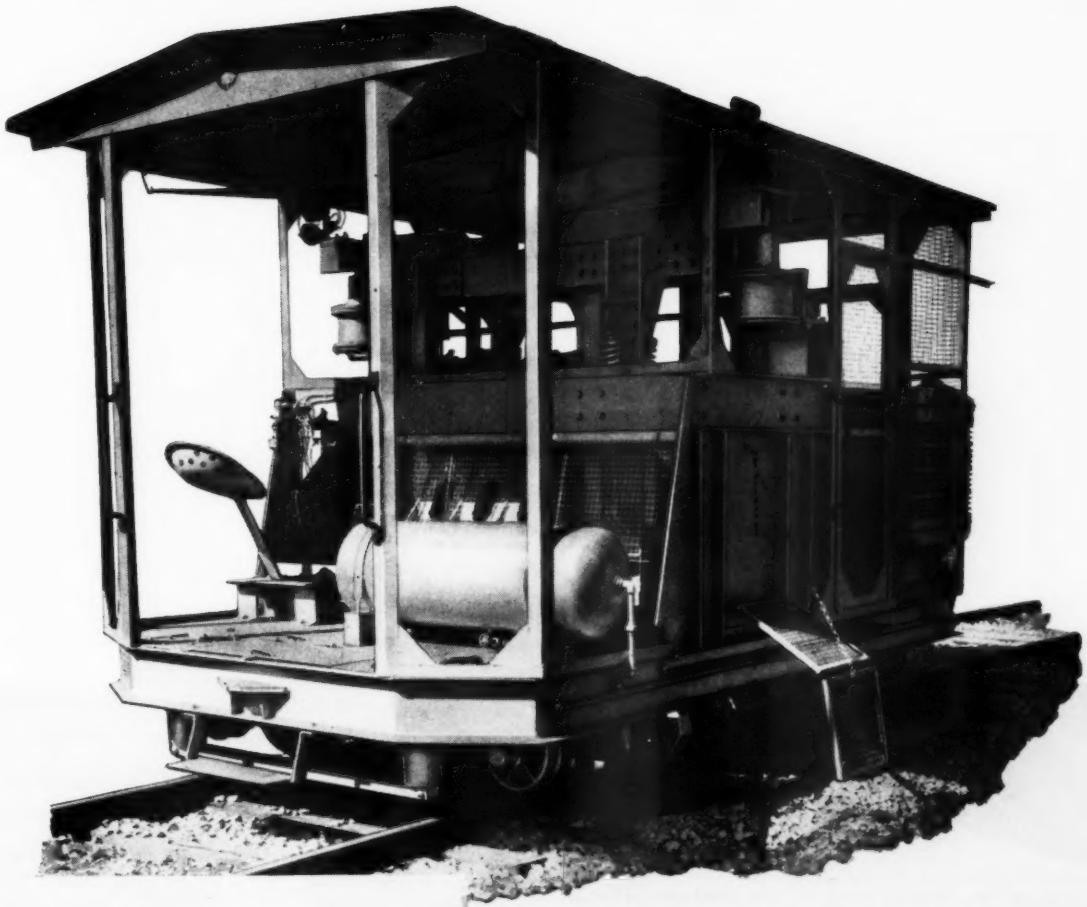
In labor cost per mile: $1,570.00 (78%).

You'll want this fact-filled brochure

"Track at Its Level Best" clearly explains the construction and operation of the Pullman-Standard Power Track Cribber, Ballast Cleaner, and Power Ballaster (tamper). 24 pages: profusely illustrated; data-file size. Let us send you a copy.

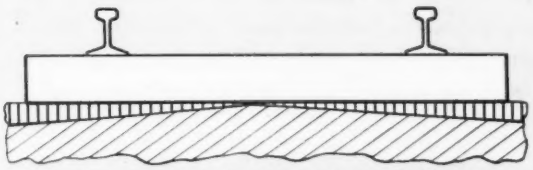
Mechanized track maintenance with Pullman-Standard equipment offers *proved economies*, to set against increased wages and the 40-hour week. The Pullman-Standard Power Track Cribber *alone* can effect great savings—and its teammates, the Ballast Cleaner and the Ballaster, may be used with it, in production-line sequence, to save additional costly man-hours.

These economies are *facts of record*, in instance after instance. They are worthy of the most careful consideration in any railroad's current budget planning. Further information will be gladly supplied.

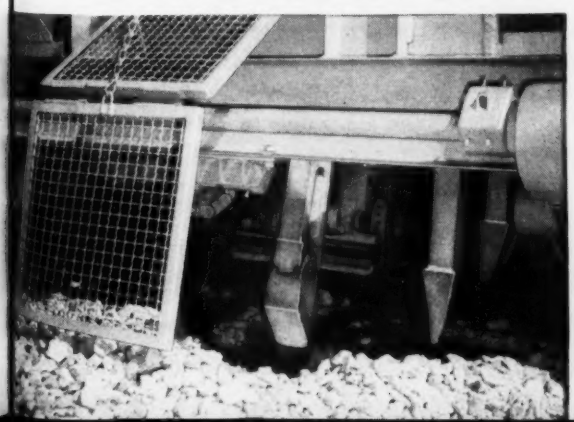


Powered by a 100-h.p. gasoline or Diesel engine, the Pullman-Standard Power Track Cribber travels to and from location at a speed of 25 miles per hour. Power-operated jacks and transverse wheels permit complete setoff in from three to five minutes.

Railroads operating Pullman-Standard Power Track Cribbers think in terms of *mileage* instead of footage. Typical performance—1.8 cribs per minute.



To restore proper drainage, the Power Cribber cuts a uniform profile, level with the tie base at the center and sloping to 3½ inches below the tie ends.



Double action! While digger bars are clearing out one crib, the "pile-driver" impact bars shown at right are loosening the ballast in the crib ahead.

Pullman-Standard

CAR MANUFACTURING COMPANY

POWER BALLASTER DIVISION

79 East Adams Street, Chicago 3, Illinois

BIRMINGHAM 3, 1004 First National Building • CLEVELAND 15, 907 Midland Building
PITTSBURGH 19, 1115 Gulf Building • NEW YORK 17, 52 Vanderbilt Avenue
WASHINGTON 6, D. C., 1025 Connecticut Avenue, N.W.

SAN FRANCISCO SALES REPRESENTATIVE: MARK NOBLE

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

Products Index

RAILWAY ENGINEERING AND MAINTENANCE December, 1949

Please send me additional products information as requested below.

☐ Literature Only ☐ Desire to see Representative ☐ Price Data

Product and Page No. .....

" " " .....

" " " .....

" " " .....

Name .....

Title or Position .....

Company .....

Address..... City..... Zone..... State.....

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Postage Will be Paid by Addressee

BUSINESS REPLY CARD

First Class Permit No. 32418, Sec. 510, P.L.&R. Chicago, Ill.

No Postage Stamp Necessary If Mailed in the United States

RAILWAY ENGINEERING & MAINTENANCE
30 Church Street
New York 7, New York

READER SERVICE DEPT.

Before you decide

Ask users about the REMARKABLE

JACKSON MULTIPLE TAMPER

Or rent one to find out on your own track how you can put up track better, cheaper and faster.

A few machines are available for rental. Experienced field men will assist you with the initial installation and suggest means and methods of taking full advantage of this machine's extraordinary, proved potentials.

Write, wire or phone for complete details.

ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON - - - MICHIGAN

For additional information, use postcard, pages 1151-1152

Mechanize

with

OFF-Track Equipment

to do more work

in fewer hours

CONSTRUCTION AND MAINTENANCE—A-C Diesel Tractors work with dozers, scrapers, shovels, winches, other equipment on all types of construction and maintenance, derailments, repairs. Four models, 11,000-lb. to world's largest, 40,000-lb.

GRADE, BUILD ACCESS ROADS — Slope, backfill, cut out and reshape ballast, remove snow, etc. with A-C Motor Graders. Four heavy-duty diesel models, 50.4 to 104 b. hp., and low-cost gasoline model for light work.

Operating free of the tracks, Allis-Chalmers 2-cycle diesel tractors and motor graders keep working hour after hour — while trains move through on schedule. They are quickly moved from job to job by flat car, trailer or under their own power. Go into action immediately. Handle work close to or far from tracks. Operate more safely, at lower cost, and put in as much as 50 percent more working time than rail-bound equipment.

Write for complete information, or let us put you in touch with your Allis-Chalmers railroad dealer for a demonstration.

THERE ARE RIGHT SIZE AND TYPE ALLIS-CHALMERS MACHINES AND AUXILIARY EQUIPMENT FOR EVERY JOB

MOW, HAUL, SWEEP, do many other jobs with A-C Wheel Tractors. Compactly built, maneuver easily, turn short . . . plenty of power! Electric lights and starting. Built rugged for tough railroad service.

ANY POWER REQUIREMENT — Low-cost A-C Power Units are high in torque, provide heavy-duty power for any service. Nation-wide service. Choice of fuels. Five models, 15 to 110 hp.

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE, U. S. A.

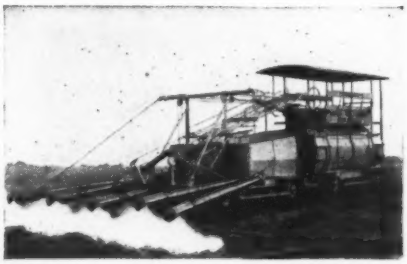
Get Results!

with

WOOLERY

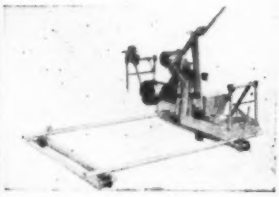
WEED BURNERS

WOOLERY MODEL PB-B WEED BURNERS



WOOLERY WEED BURNER MODEL WBZ

Better known as WOOLERY GIANT OCTOPUS. Five burner type, burns swath 25 feet wide in one trip. All burners controlled from operators seat.



WOOLERY MODEL N TIE CUTTER

Allows tie removal with little or no ballast disturbance or deep trenching. Cuts ties in 3 sections for easy removal. With undercarriage, cutting both ends of tie is possible without turning machine.

Burn . . . RIGHT-OF-WAYS CLEAN AND FREE OF WEEDS...REDUCE MAINTENANCE COSTS

WOOLERY WEED BURNERS destroy all weeds along tracks with a solid wall of flame . . . yet use less fuel per mile of burning. The smoother cleaner roadbeds require less upkeep and repair, resulting in a double saving . . . your maintenance dollar goes farther using WOOLERY burning equipment.

AN EXAMPLE OF WOOLERY efficiency is the model PB-B illustrated. This three burner model burns a swath 15 feet wide on one trip and up to 25 feet on a second trip. Burns weeds in ditches and along embankments too, with burner arms controlled by operator. Other WOOLERY models feature 1, 2 and 5 burners to meet your specific requirements.

Do your job right . . . just as more than 75 major railroads are doing. Use WOOLERY equipment to keep your roadbeds weed free at less cost.

WRITE FOR DESCRIPTIVE BULLETIN

WOOLERY MACHINE COMPANY

MINNEAPOLIS MINNESOTA

Pioneer Manufacturers of **RAILWAY MAINTENANCE EQUIPMENT**

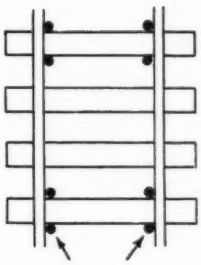
RAILWAY WEED BURNERS • MOTOR CARS • FLANGEWAY CLEANERS • TIE CUTTERS • TIE PLATE SPACERS • RAIL JOINT OILERS • CREOSOTE SPRAYERS

EXCLUSIVE EXPORT REPRESENTATIVES: PRESSED STEEL CAR COMPANY, INC., PITTSBURGH, PENN.

You can SAVE

$5.28 Per 39 ft. Panel of Track!

on cost of ANCHORS



Conventional Anchor

Comparable costs of boxing 8 ties with conventional anchors, and with NO-CREEP anchors. In each case, 8 ties per 39 ft. panel are anchored TWO ways.

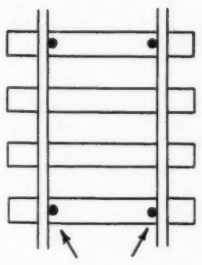
Using Conventional Anchor

32 anchors, estimated cost	$9.60

Using NO-CREEP Anchor

16 anchors, cost	4.00
Plus welding (if we do welding) 2c per anchor	.32
Total cost	4.32
Savings on anchorage cost	$5.28

Plus . . . additional savings through elimination of maintenance.



Our 1-piece 2-way Compression Anchor

Figure these savings against your track program for 1950. Also bear in mind that when using the NO-CREEP Anchors you eliminate the annual cost of resetting or adjusting anchors.

In addition to the above, consider the following:

Railroads now spiking anchor holes in tie plates as well as line and gauge spiking, can eliminate line and gauge spikes on each tie plate where NO-CREEP Anchor is used. The NO-CREEP spring holds down far more than 2 standard spikes will hold.

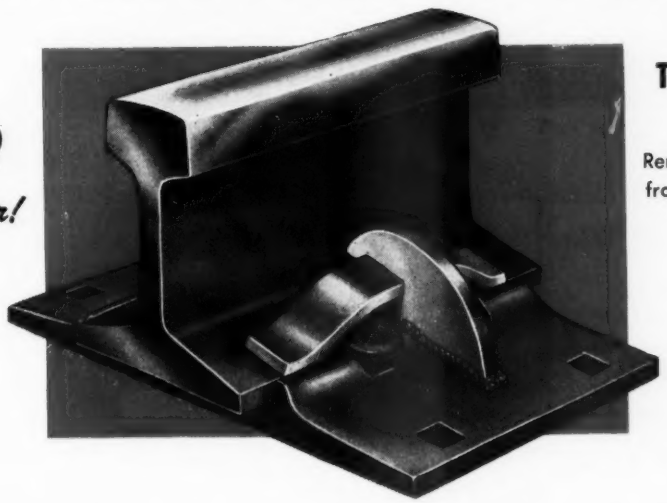
This produces an additional saving of $3.84 in spikes and driving, based on 8 ties per 39 ft. panel of track being anchored.

All anchors hold rails. The NO-CREEP Anchor holds rails and **SAVES MONEY!**

Use the

NO-CREEP

Rail Anchor!



Two-way Compression Anchorage

Remains constantly Engaged from time of Installation—Without Attention

Write for details

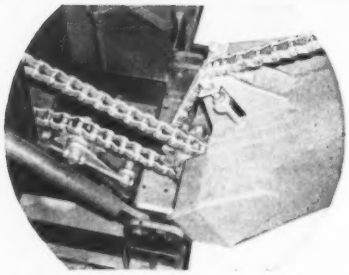
G & H RAIL CONTROLS, INC.

Phone BE 8117 **5204 Truman Road** **Kansas City 1, Mo.**

Eastern Representative: Henry A. Hillman Organization, 73 East State St., Westport, Connecticut
Southwestern Representative: Alfred Engineering and Equipment Co., 515 Cotton Exchange Bldg., Dallas 8, Texas
Western Office: Roy H. Weber Co., 68 Post St., San Francisco 4, California

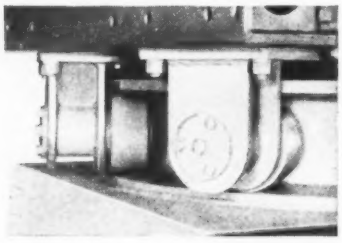
LINK-BELT SPEEDER LS-71 Shovel-Crane

3/4 YARD CAPACITY



POSITIVE CHAIN CROWD

transmits power efficiently to dipper, is self-adjusting to all boom angles and one lever controls crowd and retract.



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Simplify and Speed-up your earth-moving or material handling operations by giving such work to a Link-Belt Speeder shovel-crane—Crawler-mounted off-the-track equipment is the logical choice for this type of work, as it is easily maneuvered into its most favorable operating position, and continues to work regardless of traffic on the rails.

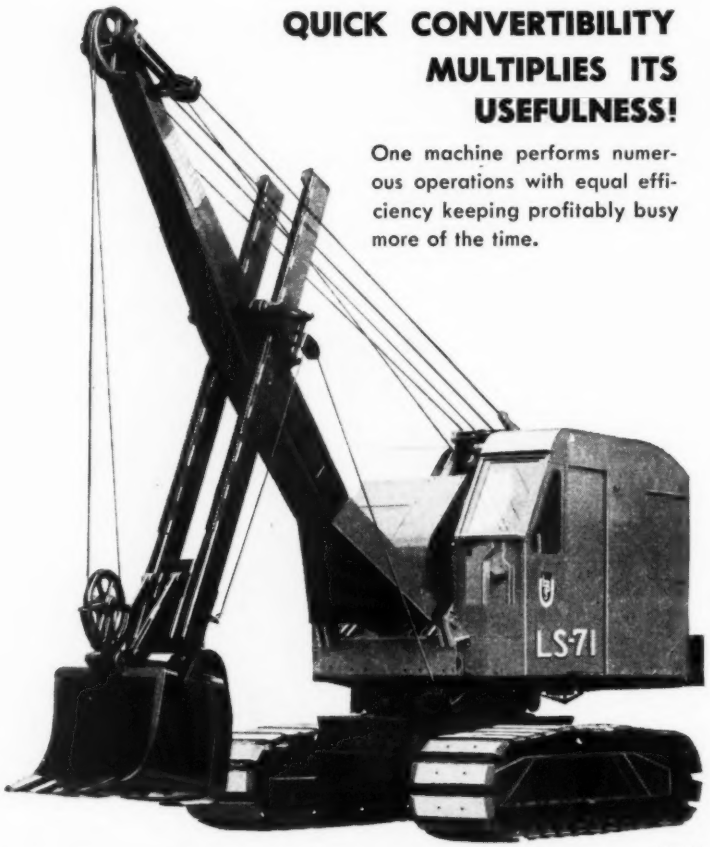
The Link-Belt Speeder does MORE WORK, MORE KINDS of work, MORE OF THE TIME!

A PACKAGE OF POWER—SPEED—STAMINA!

Up to the minute in every detail of design and construction, the LS-71 is the product of long experience in designing and building to the needs of the construction industry. It combines working efficiency, operating economy and long life to an exceptional degree — qualities which add up to a bigger return on your investment. Send for latest catalog No. 2312.

QUICK CONVERTIBILITY MULTIPLIES ITS USEFULNESS!

One machine performs numerous operations with equal efficiency keeping profitably busy more of the time.



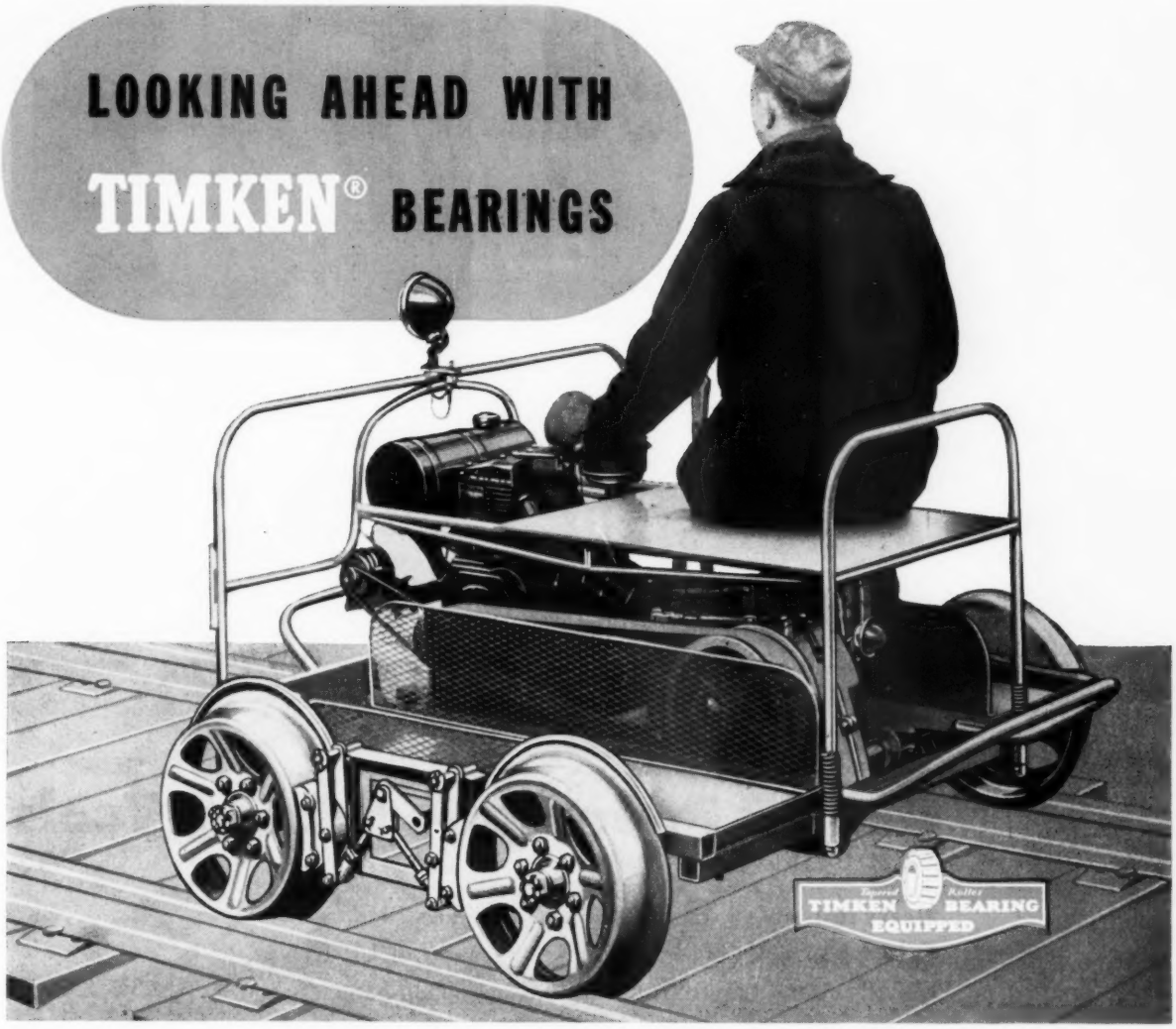
11,625-A

LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS IOWA

Builders of the Most Complete Line of SHOVELS-CRANES-DRAGLINES

LOOKING AHEAD WITH TIMKEN® BEARINGS



This is Northwestern Motor Company's new Type 538R light one-man section car — a two-man capacity car designed for one-man handling. Running weight, 600 lbs.; lift weight, 140 lbs.; speed, 35 miles per hour.

Like all Northwestern motor cars, the Type 538R is equipped with Timken tapered roller bearings on all axles for smooth, friction-free operation; protection against radial, thrust and combined loads; minimum operating and maintenance attention.

In addition to the axle applications, Timken bearings also are used in the reversible tilting transmission which is pivoted to the driving axle and serves as a belt tightener as well.

Make sure you have main line equipment performance in the section cars you build or buy; insist on Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

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TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

for faster removal of

rust

scale

paint

The easily held CP-404 strikes 10,000 B.P.M.—works in close quarters.

use CP Pneumatic Scaling Tools

Heavy rust, scale or paint is readily removed, without damage to metal surfaces, by rapid vibratory action of CP Scalers. Chisels are not required; the fast-hitting piston hammers act as the chisel. CP Scalers are available in single and triple piston models.

* * *

CP Wire Brush Machines, either with straight or pistol grip handles, are available with a wide choice of radial and cup wire brushes for loose scale. Range of operating speeds runs from 4200 to 9000 R.P.M.

Write for Bulletin SP-3008

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General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

The Difference is $2600 a year per car!

That's a lot of difference.

Especially when you consider that it represents net savings from just *one* car in *one* type of maintenance-of-way service.

Look at it this way—

It takes time and skilled labor to unload worn-out, obsolete air dump cars or to unload gondolas with a crane. But it takes *less than a minute* for anyone to dump a fully loaded Magor Automatic Air Dump Car.

Figure that your work train costs about $200 a day. That includes time, labor and equipment. By replacing gondolas or old air dump cars with New Magor Automatic Air Dump Cars, you save at least an hour a day. That's your $2600 a year savings.

But you'll use your new Magor Air Dump Car for more than just one type of service. Probably everything from ditching to snow removal. And in every operation you are cutting time and labor costs.

Cutting work train costs is just one part of the story. Years of research, experience, field tests and top engineering skill are incorporated into the new Magor Automatic Air Dump Car. They'll operate efficiently and dependably under all conditions.

For additional information about the New Magor Automatic Air Dump Car, write for Bulletin DR-112.

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New Magor Cars cost less than $1.25 a day to own.

CAR CORPORATION, 50 CHURCH STREET, NEW YORK 7, N. Y.

World's Largest Producer of Air Dump Cars

TORSION RES

Advantages

1. Narrower head. Less leverage exerted by wheels.
2. Stronger fillets for greater strength.
3. Better weight distribution permits greater height, resulting in substantially increased stiffness of rail. This distributes load more evenly over more ties.
4. Permits improved joint bar design.

THE RAIL JOINT CO

ESISTING RAIL

T.R. Rail Costs Less Per Mile

The first T.R. Rail was laid on the C. B. & Q. in 1943. Since then, over 800 miles of this rail have been laid on their lines.

The advantages that prompted its adoption have been proven in service on both curves and tangents. T.R. Rails are more economical in that they are stronger and yet cost less per mile.

OMPANY, INC. 50 CHURCH ST. NEW YORK 7, N. Y.

FIRE PROTECTION FOR BRIDGES AND TRESTLES

—excerpts from Committee Report, read by Mr. L. R. Morgan of the New York Central Railroad

Presented here as an Industry Service to introduce the

LIBBEY-ZONE PROCESS

This wooden trestle was practically a total loss from fire damage. Note the buckled rail.

The following is an excerpt of a committee report on "Methods and Materials for Fire Protection for Bridges and Trestles" presented recently by Mr. L. R. Morgan, Fire Prevention Engineer, New York Central Lines. We believe these remarks will be of great interest to every railroad official, whether or not directly charged with fire prevention duties.

"Fire protection, and particularly fire prevention, for bridges and trestles in remote or inaccessible locations has been a major maintenance problem for many years, and methods and materials used to overcome this problem have varied from the treatment of all timbers in structures to the replacement of open decks with ballast decks, or decks of concrete and steel.

"On the majority of railroads it has been the policy to replace open-deck trestles with structures having ballasted decks as rapidly as renewals are necessary, this being particularly true with respect to main-line structures.However, since the replacement of all open-deck bridges and trestles with fire-resistant structures cannot possibly be accomplished for many years, the railroads will continue to have a large number of open-deck bridges and trestles to maintain, many in remote and sparsely populated locations.

Skilled labor is not needed to apply the Libbey-Zone Process. The work goes rapidly.

Asphalt and Gravel Coating

"After numerous tests and trials of various methods of protecting open-deck structures against fires, a western railroad developed a method of covering the exposed wood surfaces which gave promise of being extremely fire resistant. This method involves the brushing or spraying on of a special patented asphalt compound, which, under test, was found to form a fire-preventive coating superior to anything previously used. Since its development, the decks of a large number of open-deck structures have been covered with this material, and the process of application has been greatly simplified and improved. At the present time a deck structure 30 ft. long can be completely coated within 2½ hours, if the materials are reasonably accessible.

"The most effective results with this method are being obtained by making a hot application of a primer coat to the exposed wood surface. The primer coat is applied with brush or spray to a reasonably heavy film, care being taken to see that all cracks or crevices are filled.

"A second coating is applied immediately after the primer coat, by brush or spray, covering all surfaces with a 3-16 in. thick layer of the patented asphalt compound, which contains asbestos fibres and gilsonite. Immediately after the application of the second coat, crushed stone, washed, and from 1-8 in. to 3-8 in. in size, is spread over the hot compound in a layer about 1-2 in. thick.

Applying the Aggregate

"No particular effort is made to apply the aggregate to the vertical surfaces of ties and stringers. However, a 1-in. board can be nailed to the sides of guard timbers after the second coat is applied, leaving a 1-2 in. space between the board and timber, which is then filled with aggregate. In a few hours the board may be removed, leaving the aggregate held in place on the sides of the timber by the compound.

"Spacer blocks and sidewall ledgers are given an extra heavy coating of the compound and aggregate, particularly if in depressed position. However, recent construction changes bring spacer blocks to the surface of the ties, thus eliminating pockets for hot metal or ashes to fall into. As the compound has a tendency to stretch over cracks and to sink into low spots without affecting its continuity, the heavy application of the compound in depressed areas is desirable, compensating for the shrinkage and splitting of timber.

"In warm climates it is not necessary to heat the primer or compound, but in cold weather it is beneficial to heat both, as well as the aggregate. The material bonds equally well on untreated or treated surfaces.

"The combination of compound and aggregate holds white hot brake shoe splinters or burning fuses away from the wood so they will chill or burn out without setting fire to the wood. Even when the heat is so intense that it will char the wood below the protecting coat, the wood will not burst into flames and burn.

"The wide climatic variations on western railroads has been another factor of major importance in the application of fire-resistive coatings to bridge decks, since all previous treatments leeched out under rain and sun, or cracked and disintegrated under freezing weather. This compound has proved equally effective in desert and mountainous territories."

This wooden structure has been fireproofed under the Libbey-Zone Process. White hot brake slivers and other hazards can no longer cause trouble.

The fire protection process described above is identical to that featured in the *Libbey-Zone Process*—now used by many leading railroad systems. For full information concerning the *Libbey-Zone Process*, we suggest you write for our illustrated booklet. *"The Libbey-Zone Process."* There is no cost or obligation.

Write for illustrated booklet—no obligation

THE ZONE COMPANY

A Division of the Southwestern Petroleum Company

Fort Worth 1, Texas

Regional Representatives: John A. Roche, 80 E. Jackson Blvd., Chicago, Illinois and Clarence Gush, Railway Exchange Bldg., St. Louis, Missouri

Another great DIESELECTRIC*... capacity 25 tons

About 2½ years ago, American Hoist formally introduced the DIESELECTRIC locomotive crane principle in the now-famous Model 840, of 40 tons capacity. Since that time, more than 100 of these units have been built and sold . . . *and not one diesel crane of this size has been sold in the United States.*

Responding to insistent demand, we have now adapted the principle of "diesel power to the deck, electric power to the trucks" in this 25-ton model—the most widely used size of locomotive crane. While it is of the same basic design as the Model 840, it has even more money-saving features. Offers 25% to 50% maintenance savings, like the 840. Pays for itself in a few short years.

Whether your next crane will be bought next week or next year, you should have the facts about the American 25-ton DIESELECTRIC *now*. To get them, mail the coupon below.

★Diesel-Electric Locomotive Crane, Patent No. 2083460. Touch Control, Patent No. 2370856.

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For additional information, use postcard, pages 1151-1152

CONCRETE PILES

...built to last under severe salt water exposure

COVERING an over-water area of ten acres, the new Norfolk and Western Railway merchandise pier at Lambert Point, Norfolk, Va., is supported by 5,406 concrete piles averaging 70 ft. in length. These piles had to be designed to withstand severe exposure and salt water action. This was accomplished by using a relatively rich mix (1:2½:3½ with 5½ gal. of water per sack of cement).

Designing durable concrete piles is another application of the well-defined and thoroughly-tested principles and procedures of quality concrete construction. These principles and procedures are the key to strong, enduring concrete that performs satisfactorily under any climatic, soil, water or service condition.

For complete details about quality concrete write for a 70-page book, "*Design and Control of Concrete Mixtures.*" If you'd like more information about concrete piles, send for 80-page illustrated book, "*Concrete Piles.*" Both are free but they are distributed only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION

DEPT. A12-27, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

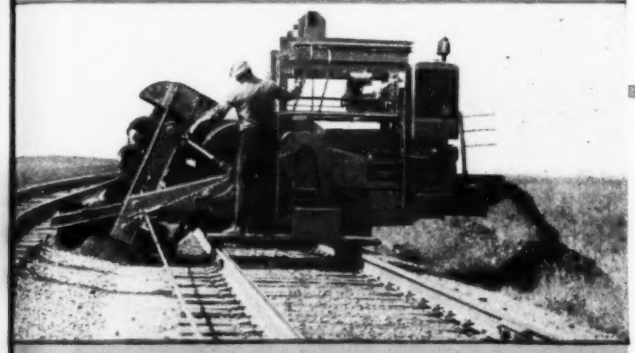
NOW AVAILABLE ON DIRECT SALE OR LEASE...

These 3 NORDBERG MACHINES provide the answer to your BALLAST RECONDITIONING PROBLEMS

Four CRIBEX units removing fouled gravel ballast

CRIBEX

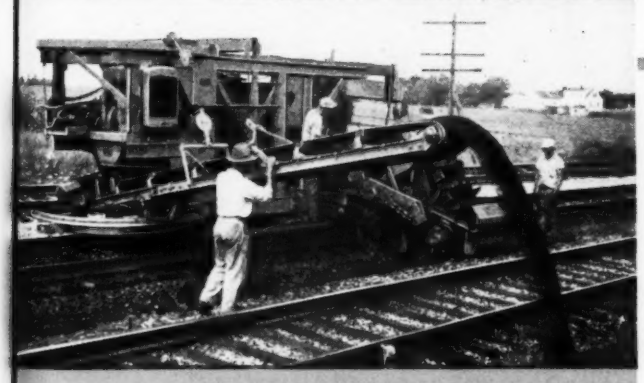
- For removing fouled ballast from between ties and switch timbers.
- For lowering track.
- For cribbing when a complete ballast cleaning operation is done, together with the Nordberg Ballastex and Screenex.



BALLASTEX wasting muddy gravel

BALLASTEX

- Removes intertrack ballast in a wasting or track lowering operation.
- Excavates intertrack or shoulder ballast and feeds to Screenex in a cleaning operation.



BALLASTEX — SCREENEX cleaning stone ballast

SCREENEX

- Intertrack and shoulder ballast screen-cleaned where partial cleaning is desired.
- Crib material plus intertrack and shoulder ballast screen-cleaned where complete cleaning is necessary.

• These three Nordberg Machines provide you with a maintenance "tool" that is as flexible as it is economical . . . *and now, these time-tested Nordberg Machines are available either on a direct sale or lease basis.* Write for Bulletin 174.

R1249

Look to NORDBERG

. . . *for continually improved* TRACK MAINTENANCE MACHINERY *to do a Better, Faster Maintenance Job at Lower Cost*

NORDBERG MFG. CO., Milwaukee 7, Wisconsin

No. 252 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: Traveling—At Your Expense

December 1, 1949

Dear Readers:

I have been a long way from my desk since I addressed you in the November issue. During the past month, necessarily, I worked in a couple of long-distance airplane flights.

No, I haven't become air-minded, but, without bothering you as to the reason for the trip, I did find myself flying from San Francisco to Honolulu and return. I wouldn't even bother you with this information if it were not that—as a railroad editor—my flying experience impressed me far beyond the mere ride, with thoughts which should interest you—as railroad men.

I rode de luxe, both by streamliners to and from the Pacific coast, and by stratoliners over the Pacific to and from the Islands. Both modes of travel offered everything in comfort and luxury, but I couldn't help feeling that while I was paying my full way by train—for transportation, meals and other services—I was leaning, in part, on you, and all other taxpayers, for my plane rides. Yes, not only in tne fare paid, which I know did not cover my share of total operating costs, but also in the free meals and free cocktails that were dished out both ways.

As one who, like yourselves, is interested in a square deal for the railways, I could not but think of the unfair competition that the airways are thus giving our industry all over the country—competition priced low enough to attract patrons from the railroads, without regard to actual over-all costs, and depending upon federal and municipal taxpayers to make up the deficit.

I don't have the figures before me as I write, but I do know, as you know, that millions of dollars have been spent by the federal government and municipalities for airports that are used by commercial air lines, and that additional millions are being spent annually by the federal government for air navigation aids. Furthermore, I know that, in spite of this help, most commercial air lines are existing only because of generous government subsidies.

In this latter regard, do you realize that the government Post Office Department, during the fiscal year ended June 30, 1948, paid the air lines more than 25 times as much per average piece of first-class mail handled by air as it paid the railroads per average piece of first-class mail handled by rail. Furthermore, that while in the fiscal year 1948 the air lines carried only about 6 per cent of all inter-city mail, they actually received $15,000,000 more for this service than was received by the railroads, which carried the other 94 per cent?

What a deal! As taxpayers, you and I should be plenty "hot under the collar" about this expenditure of our tax money for the benefit of air line passengers and air mail users. And as railroad men, we should be "burned up" with indignation that this use of our tax money is making it possible for the air lines to undermine our industry. Let's resolve to demand at every opportunity a square deal for the railroads in this matter of competition by the airways—and also by the highways and waterways, about which I shall write you on another occasion.

Sincerely,

Neal D. Howard
Editor

NDH:ag

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Fairmont

. . . the name

that means most

on maintenance

equipment

. . . it would be literally impossible to estimate the millions of miles that Fairmont equipment has traveled on the railways of the world. It would be equally impossible to imagine the wide variety of jobs on which Fairmont motor cars have served—or to visualize the amount of time and money they have saved. But one thing is certain: No other name in all the world of rails means quite the same thing as the name "Fairmont". It has—in the course of 40 years of working—come to mean the most reliable, the most efficient and the most durable of all railway maintenance equipment. We feel confident that in the future, as in the past, every piece of Fairmont equipment will prove and re-prove the validity of the Fairmont slogan—"Performance on the Job Counts." . . . Fairmont Railway Motors, Inc., Fairmont, Minn.

Performance
ON THE JOB
COUNTS

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PRINTED IN U.S.A.

VOL. 45, NO. 12 DECEMBER, 1949

Racor Switch Point Locks

Fig. 3911
SWITCH POINT LOCK
(Patented)

Provide added protection for New York Central's passenger train operation.

Essential to the safe operation of these trains, facing point switches must be secured in a closed position, regardless of failure or damage to the throwing mechanism. Racor Switch Point Locks can be installed with all designs of main line switch stands. Ruggedly designed — easily installed below top of ties as protection against damage, they function independently of stand.

Fig. 3911 (illustrated) for use with all types of column throw stands.
Fig. 3912 available for use with all types of ground throw stands.

America's most complete line of track specialties

- AUTOMATIC SWITCH STANDS
- VERTICAL SWITCH RODS
- SAMSON SWITCH POINTS
- SWITCH POINT LOCKS
- RAIL LUBRICATORS
- DEPTH HARDENED CROSSINGS
- REVERSIBLE MANGANESE STEEL CROSSINGS
- MANGANESE STEEL GUARD RAILS

AMERICAN Brake Shoe COMPANY

RAMAPO AJAX DIVISION
109 North Wabash Avenue, Chicago 2, Ill.

RACOR

Branch Lines —

Save Them — But First, Let's Secure the Main Lines

The railroads of the United States are shrinking mileagewise. This may or may not be the cause for serious concern. But when the railroads of the country shrink trafficwise, there is real cause for concern upon the part of every railway officer and employee.

Recently, Harry Barron, counsel, Executive committee, Western Traffic Association, addressing a group of industrial traffic managers and other shippers in Chicago, made a strong appeal for "Saving the Railroad Branch Lines"—in the mutual interest of communities, shippers, and the railroads. Pointing out that from 1917 to 1945, inclusive, more than 34,600 mi. of railroad lines were abandoned in the United States, he gave the reason therefore largely as subsidized, little-regulated highway competition, and expressed scant sympathy for those whining communities and industries which have brought about one branch line abandonment after another by their short-sighted policy of abandoning the railroads for this newer form of transportation.

Charging that invariably communities have abandoned the branch lines before the branch lines have been abandoned by the railroads, Mr. Barron made it clear that there was no alternative to line abandonment in such cases—that if a railroad is to remain solvent as an operating system, its branches must earn expenses and feed the main line, and that if the national system of railroads is to be prosperous, the individual roads must be prosperous. Then he proceeded to tell communities and shippers a story that every railroad officer and employee should be constantly telling communities and shippers—of the many reasons, including year-around, all-weather transportation service, greater trade and industrial development, and large railroad-paid taxes, why, in their selfish interest, they should support the branch lines serving them.

Save the branch lines? Yes, that should be the aim of the railroads and their employees to the extent that the communities and industries involved can be persuaded to make such lines pay their way and contribute to the general prosperity of the railroads. But today the problem, and the concern of the railroads, goes far beyond saving their branch lines. Today, emphasis must be placed upon the problem of saving the railroad main lines. Today, some of the same factors that have made branch lines unprofitable and have brought about their abandonment are seriously threatening many main lines—indeed, individual railroads as a whole. Among these factors are high operating and maintenance costs on the one hand and the short-sighted policy of communities and shippers on the other, in turning to subsidized forms of competition for fancied economies or other temporary advantages. This, then, is the more serious problem of the moment, a problem which requires the best thinking of all railway managements and employees if the railroads are to prosper, continue large-scale employment, and best serve the nation in peace or war.

This thinking must encompass the united, effective effort of managements and employees to improve every form of service rendered by the railroads; united, effective effort to "sell" the railroads, and their indispensability to the welfare of the country, to communities, shippers and the public generally; united, effective effort to reduce operating and maintenance costs to the minimum; and united, effective opposition to every form of unfair regulation, taxation, or subsidy to competing forms of transportation.

(Continued on page 1176)

With this kind of united, effective effort—and generally good business conditions—the months immediately ahead, and succeeding postwar years, may well witness for the railroads a repetition of what took place in the postwar years 1922-1929. In the latter part of 1922, following a year which had been characterized as the Worst Year in Railway History, rail traffic improved so much that the railroads reported the largest shortage of freight cars in their history—a shortage which continued until almost the middle of 1923. During the rest of 1923 the railroads got such complete control of the situation and so greatly increased their efficiency of operation that in the entire year 1923 they handled a larger freight traffic than they ever had before; earned more net operating income than ever before, excepting 1916; increased their investment more; and made larger purchases of equipment and materials than in any previous year. Then followed the unprecedented period of prosperity for the railway industry which did not end until 1929.

With generally good business conditions ahead, it is not inconceivable that history will repeat itself—that the railroads will again prosper. But whatever the future hold, it is a certainty that it will be better for the railroads—branch lines and main lines—if managements and employees will work together effectively as a team to improve service, reduce costs, and oppose every form of unjust discrimination in favor of competing transportation agencies.

DEFERRED UPKEEP—

Big Increases Shown by I.C.C. Figures

ACCUMULATED deferred maintenance on the Class I railroads of the United States as of December 31 of this year will show a substantial increase as compared with a year ago, according to the latest issue of the "Railroad Maintenance Study", which is made annually by the Engineering Section of the Interstate Commerce Commission's Bureau of Valuation. To be exact, the figure will be $875,000,000, all in fixed-property items, and compares with $560,000,000, also all in fixed-property items, a year ago.

The property items in which deferred maintenance is found, and the amount for each account, are as follows: superintendence, $12,392,000; ties, $254,422,000; rail, $150,902,000; other track material, $165,826,000; ballast, $18,312,000; and track laying and surfacing, $328,486,000.

Discussing the causes for the sharp increase in deferred maintenance, the bureau stated that the wage increase of seven cents an hour in the latter part of 1948 and the inauguration of the five-day week in the latter part of 1949 "very materially increased the unit prices at which the deferred maintenance could be liquidated" and that the coal and steel strikes caused sharp curtailment in the replacement of ties and rail.

The bureau professes not to be disturbed by the dollar magnitude of present deferred maintenance. While admitting that the figure of $875,000,000 seems large, the bureau points out that it is less than 30 per cent of the total annual maintenance expenditures (including maintenance of equipment) for one year and only about 65 per cent of the annual expenditures for maintenance of way and structures alone.

On the other hand, it was pointed out that, because of the sharp curtailment of rail and tie renewals in 1949, the estimated deferred maintenance in these items during the year amounted to $110,000,000. The bureau estimates that tie renewals for 1949 will fall 17,000,000 ties ($48,000,000) short of meeting the requirements. With respect to rail it was shown that, while the computed normal requirements for the year (less 20 per cent for obsolescence that will not be made good) amounted to 1,634,000 gross tons, estimated rail renewals during 1949 totalled only 1,272,000 tons.

DO YOU PREFER—

Wise Owl Clubs or Seeing-Eye Dogs?

AN IDEA, born in the mind of an employee of a railway supply company, has been credited with having saved the eyesight of more than 500 workers in various industries. The story of the birth of that idea, of its dissemination among workers and its impact on industrial safety will bear telling, and continual repetition, in the railroad industry—and in the maintenance-of-way department in particular.

According to Nation's Business, a grinder operator in the employ of the American Car & Foundry Co. was leaning over his machine with a brakeshoe in his hand. A hot, glowing piece of metal suddenly broke from the brakeshoe and shattered one lens of his goggles. It took only seconds for him to realize that his goggles had saved his eyesight, thereby preserving his capacity to earn a living and assuring his security and that of his family.

He reasoned that a club composed of men whose eyesight had been saved by goggles, could be an active army of safety-conscious individuals working for the benefit of their fellow employees. With the enthusiastic help of A.C.F. such a club was formed and named the "Wise Owl Club", having as its insignia an owl wearing safety glasses. The members, impressed by their own escape from blindness, dedicate themselves to help others safeguard their eyesight by wearing goggles. The idea has now been developed nationally by the National Society for the Prevention of Blindness and the number of clubs is growing constantly.

In Wise Owl Clubs, railway Safety committees have an excellent device for helping to promote safe practices. The clubs are founded on an accident that was prevented by observance of safety rules. They are claiming enthusiastic employee participation and acceptance. Aided by such an effective, wholesome, employee-sparked device, no safety program can fail to produce beneficial results.

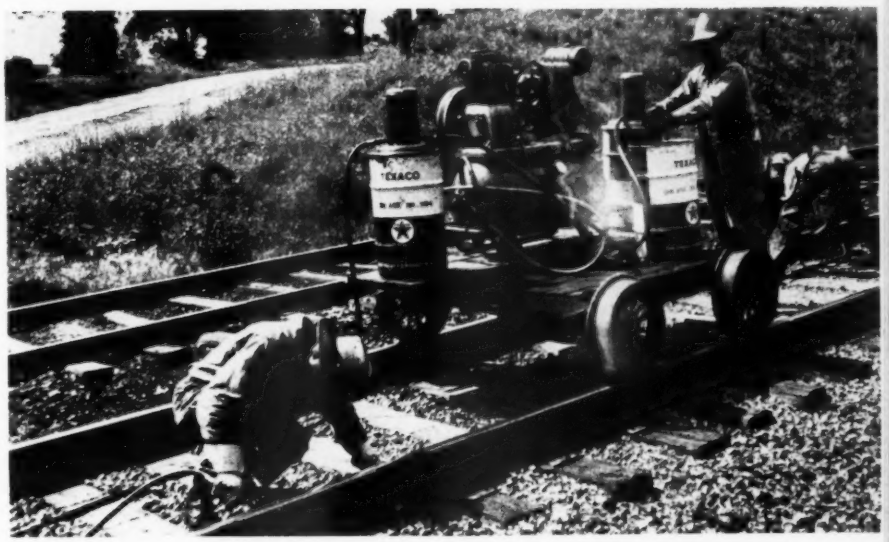
Lubrication Solves Frozen-Joint Problem

On the Wabash

Important benefits are being realized on the Wabash as the result of a program for lubricating its rail joints, which has been in progress since 1943. The method used involves the application of a graphite grease and the plugging of the ends of the joints with a plastic material. The practices followed in applying the grease, and the cost, are discussed in this article.

By W. E. GARDNER
Principal Assistant Engineer, Wabash
St. Louis, Mo.

• As insurance against the evils of frozen joints, and with a number of secondary advantages in mind as well, the Wabash is carrying out a program for applying a lubricant to its rail joints. In this work the spaces between the joint bars and the rails are filled with a graphite grease and the openings at the ends of the bars are plugged with a plastic material. Since 1943 this procedure has been used for lubricating the joints on about 700 miles of track, and the present plan is to continue the program until at least all joints in main-line tracks have been lubricated.



The power-driven equipment, comprising an engine and compressor on an air storage tank, together with two grease drums with dispensers, is carried on a push car

Results of Frozen Joints

To perform their function properly rail joints must permit the movement of the rail ends as the rails lengthen or shorten with changes in temperature. However, it is not uncommon for the joints to become frozen and when this happens the normal movement of the rails is prevented. If long stretches of frozen joints should develop, extremely high compressive stresses will be set up in the rails in hot weather, which sometimes become so great that the rail will be kicked out of line. During cold weather the tensile stresses in the rails where joints are frozen are sometimes high enough to result in a pull-apart at the weakest joint, resulting in the bolts being sheared off or broken and leaving widely-separated rail ends.

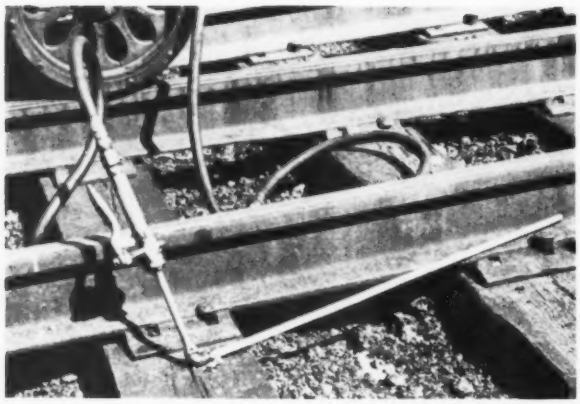
The corrosion of rail ends, joint bars and bolts, especially in territory subject to brine drippings from refrigerator cars, is another common problem. Protection against corrosion can be provided by the application of a rust preventive but such materials do not necessarily provide lubrication of the contact surfaces between the joint bars and the rails to allow free movement of the rail ends. The primary purpose of the lubrication procedure used on the Wabash is the elimination of frozen rail joints, although protection against corrosion is also provided by the lubricants used.

For many years it had been common practice to paint or spray the fishing surfaces of rail ends and joint bars with a lubricant, expecting that such a treatment would not only lubricate the bearing surfaces within the joint, allowing the rail ends to move, but at the same time would provide protection against corrosion. This method was not entirely successful in preventing frozen joints. Not only was a more effective method needed, but also one that would permit the supply of lubricant to be replenished without the necessity of removing the bars.

Several years ago the Texas Company began some experiments in which the openings between the ends of the joint bars and the webs of the rails were filled with this company's Plastic Material "H" to form a seal, after which the spaces between the bars and the rails were filled with No. 904 graphite grease, another product of the same company. Plastic "H" is an asphaltic material containing asbestos fibers, and Texaco 904 is a graphite grease with a lime-soap base insoluble in water. These materials were first used experimentally on the Wabash in 1942 for lubricating rail joints, and since 1943 they have been used on a regular basis.

Applying the Grease

Where the joint bars are to be removed for any reason, the grease is applied by hand; where the joints are to remain in place, the material is pumped into the joint spaces. As time went by improve-



Showing one of the grease guns with attached applicator pipe. The applicator consists of an 8-in. length of ¼-in. pipe and a 33-in. length of ¼-in. pipe, joined by a 90-degree elbow

To apply lubricant to a joint the applicator pipe or nozzle is inserted until it reaches the last bolt and then, while grease is being pumped into the joint, the pipe is slowly withdrawn

ments were made in the method of pumping the grease into the joints, and finally power equipment was devised for this purpose. Each year programs are carried out on the various divisions for applying the lubricant by the pumping method to the joints in existing rail. In addition, the joints for new rail are lubricated shortly after the rail is laid. When laying new rail only two bolts are placed to hold each joint until the crane has passed over it. The joint bars are then removed and the rail ends are descaled by the flame-cleaning method. The fishing surfaces of the rail ends are then given a heavy coat of 904 grease, the bars are reapplied and all bolts are tightened. After the rail has work hardened under traffic for about 60 days, the ends are hardened and the joints are packed with the lubricant.

Application by Hand

A very thorough job of lubrication can be done economically when for any reason the bars are removed from the rail. The procedure for applying the grease packing as part of an angle-bar replacement program, or at any time the bars are removed from the rail, is first to clean the rail ends and then lay the bars inside up adjacent to the rail ends where they are to be applied. The fishing spaces in the bars between the outer bolt holes, are then filled with grease, the fishing surfaces of the rail ends are painted with the material, and a brush load of grease is dabbed on the rail just back of each rail end. No grease is applied on either the rail ends or to those parts of the joint bars between the end bolt holes and the ends of the bars. The bars are then set in place, the bolts tightened, and the ends plugged with the plastic material.

To determine the proper amount of grease applied in this manner requires some experimentation. Too much grease will force the plugs out of place. With the proper amount, the plugs will stay in place and some grease will be squeezed out over the tops of the bars, under the bars and around the bolts. When this happens we are sure we have a joint so well lubricated it will benefit maintenance conditions for several years. Joints where rail ends are to be built up by welding should not be packed until welding is completed as the heat will soften the grease to a fluid state.

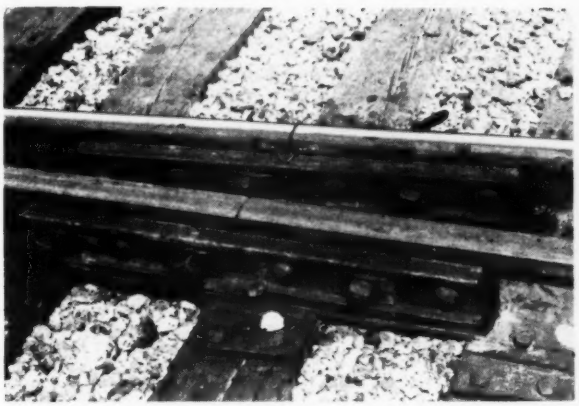
The Pumping Method

When we first began pumping the grease into the joints we used a hand-operated grease pump and grease gun of the type used in garages for greasing automobiles. This grease pump fitted the top of a 100-lb. drum of grease. To apply the grease at a particular joint one of the bolts was removed and replaced with a hollow bolt with an Alemite fitting in the head and with orifices to let the grease flow out between the web of the rail and the joint bars. However, we found that too much time was required to take out a track bolt, insert and tighten the hollow bolt, remove the hollow bolt after the grease had been applied and then replace and tighten the track bolt. A ⅛-in. copper tube was then applied to the grease gun, replacing the Alemite fitting. Using this tube the procedure was to plug the ends of the joint with plastic material and then to insert the tube through one of the plastic plugs to inject grease into the joint.

Subsequently the hand-operated grease pump was replaced with a power-driven outfit, mounted on a push car, which consists of a 15-cu. ft. air compressor, belt-driven by a 3-hp. gasoline engine. The compressor and engine are mounted on top of a 30-gal. air storage tank fitted with lifting handles. Two air-operated Lincoln liquid lubricant dispensers, fitting the tops of 100-lb. grease drums, deliver the grease through lengths of hose to two grease guns. These guns are each fitted with a nozzle consisting of an 8-in. length of ¼-in. pipe and a 33-in. length of ¼-in. pipe, joined by a 90-deg. elbow as shown in one of the photographs. Twelve feet of hose from each pumping unit permits one man to fill joints ahead of the push car while another man behind the car fills the joints in the opposite rail.

Application of Plugs

Before the grease is applied one end of each joint is plugged with the plastic, which is applied with a paddle or putty knife. This must be done carefully so the plug will act to prevent brine from collecting along the end of the joint bar where it can cause damage to the top of the rail base. Plugs that have been properly applied are shown in the illustrations.



As shown in this view the ends of the joints are plugged with a plastic material in such a manner as to prevent brine from collecting along the ends of the joint bars at the rail base

A joint two years after it was packed with grease by the power-operated equipment. Grease coming out of the joint is most in evidence at the leaving rail end, as shown in the above view

To apply grease to a joint the ¼-in. pipe nozzle on the grease gun is inserted at the unplugged end until it reaches the last bolt. As grease is being pumped into the joint, the pipe is withdrawn slowly until the end reaches the first bolt from the open end of the joint. The objective in applying the grease is to fill the joint space up to the underside of the rail head. The open end is then sealed with the plastic material. We have not as yet been successful in preventing the leakage of grease from the openings between the ends of rails, and while this results in the loss of some grease and probably shortens somewhat the life of the lubrication job, it does not seriously affect the results. A stiffer grease will probably reduce this loss but we have not yet determined how stiff the grease can be and still provide adequate lubrication.

Organization and Costs

The gang employed in applying the grease consists of a foreman and five men. One man, working ahead, plugs one end of each joint, two men operate the grease guns, one man pushes the car and does odd jobs, and one man follows behind plugging the open ends of the joints. To assure a supply of the grease when needed, 100-lb. drums are distributed in advance of the work, a drum to each 25 joints. Five-gallon cans of the plastic material are also distributed, although at somewhat longer intervals.

With power-operated equipment a foreman and five men can pack between 500 and 600 four-hole joints, or 350 to 400 six-hole joints, per day. About 3.7 lb. of grease and 0.5 lb. of plastic "H" are required for a four-hole joint, costing 42 cents for material and 10 cents for labor, or a total of 52 cents. The six-hole joints cost 47 cents for material and 13 cents for labor, or a total of 60 cents per joint.

The labor cost for the hand application of grease while bars are being replaced does not make an appreciable difference in the cost of changing out the bars, but there is a slight increase in the amount of grease used as compared with that consumed when the grease is applied with power-operated equipment.

The effects of the lubrication appear first a day or two after packing. At that time oil begins to creep over the tops of the joint bars. The work is done during the summer, and on long stretches where the gaps between the rail ends are a sure indication of frozen joints we find that the gaps close up within four or five days after the grease is applied. It is evident that there is some pumping action in the joints under traffic, which forces the grease up over the tops of the bars. If a swinging joint is packed, the grease is soon pumped out over the tops of the bars. The bolts must be tight if the joint is to retain the grease.

From present indications the grease will disappear from the joints after four or five years; however, the benefits from this method of lubrication seem to remain even after all grease has disappeared. We do not know at this time how long the benefits from original lubrication will continue before repacking becomes necessary.

The benefits from this type of lubrication are:

(1) Frozen joints are loosened within a few days after the packing is applied. The free movement of rail ends results in a considerable saving in maintenance costs by eliminating the wavy line and surface conditions that result from frozen joints. Pull-aparts in cold weather are eliminated and the necessity for cutting out sections of rail to allow expansion in hot weather no longer exists.

(2) Rail ends, bars and bolts are protected against corrosion.

(3) The plastic seal, when properly formed around the end of the joint, prevents the collection of brine on top of the rail base behind the bars.

(4) An appreciable saving is realized because of the reduction that occurs in the number of broken bolts.

(5) There is evidence that the reduction in joint wear that follows the application of the grease will lengthen the life of the joints considerably.

(6) Rail creepage is reduced.

(7) Brine, dirt and other foreign matter are kept out of the joint spaces.

While we feel that it is the method of applying the lubricant that has produced such satisfactory results, we also feel the graphite in the lubricant has been of considerable benefit in extending the life of the lubrication. We are continuing our experimental work with various types of lubricants and methods of application, but have not yet developed any improvements that justify a change.

This work has been carried out under the direction of J. C. Bousfield, chief engineer. The power-operated units were built under the direct supervision of R. S. Stephens, supervisor of work equipment, and the various improvements in methods of application are the result of suggestions made by the division forces.

Equipped with a Supersonic Depth Recorder and an outboard motor, this small boat plows along at 5 to 7 m.p.h., recording a continuous profile of the Mississippi River bed on a moving ruled chart

Supersonic Sounder S

For more than 40 years the Missouri Pacific has investigated and charted the scour or sedimentation of river beds at bridges and along its right-of-way. Until last year these soundings were made and recorded by hand methods. This article tells how the use of a Supersonic Depth Recorder has speeded up the work, made it less arduous, and greatly reduced its cost.

E. H. Daves, Jr., party chief, holds a finger on the "fix" button and keeps alert for the next reference point

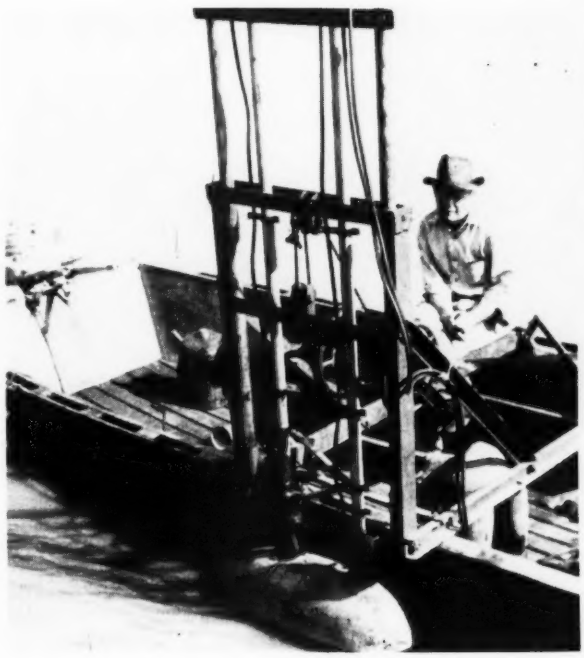
• Employing a Supersonic Depth Recorder, which it purchased about a year ago, the Missouri Pacific is reducing by 40 to 50 per cent the time required to make the extensive periodic subaqueous explorations required along its lines at bridges, paralleling waterways and ferry crossings. By hand-sounding methods, this work heretofore kept a survey party of five men working from 4 to 6 months every year in the field, plus another 1½ months plotting and recording the field data. Approximately 50 per cent of the field work previously consisted of locating river banks, ranges and reference points, and the other 50 per cent in making lead soundings. The use of the supersonic sounder has so reduced the time needed to make the actual soundings that the initial survey work—needed for both methods—now requires 85 per cent of the total time and the soundings only 15 per cent. This not only cuts the total time required to perform this work but enables the under-water exploration forces to keep pace with high water conditions and to plan more effective measures for reducing the hazards of scour or silting.

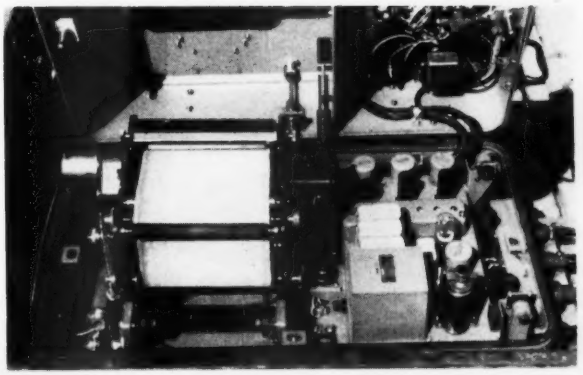
To accomplish such simplification of its subsurface investigation methods, the Missouri Pacific uses a Model ES-123 Depth Recorder, manufactured by the Bludworth Marine division, National-Simplex-Bludworth, Inc., New York. This recorder consists essentially of two parts: (1) A compact, portable recorder, and (2) an outboard oscillator (transmitter - receiver unit) called a "fish". The recorder contains a paper chart roll; operating controls, consisting of a "power" switch, "range" switch, "gain" control and "fix" button; electronic circuits; and the chart-propulsion mechanism. The "fish" consists of a sound-pressure wave transmitting and receiving unit contained in a single, cast-aluminum housing, streamlined to minimize water drag. These two units are connected by waterproof cables terminating in plugs.

For a sounding craft on which to mount these units, the engineering forces of the Missouri Pacific join together in tandem two 13-ft. army M-2 assault boats. The recording instrument case is placed in the leading boat near its rear end. In the center of the rear boat a demountable, folding, pipe-and-steel-frame outrigger is arranged to support the "fish", which is lowered over the side, just under the water surface, or raised out of the water by means of a hand-operated winch.

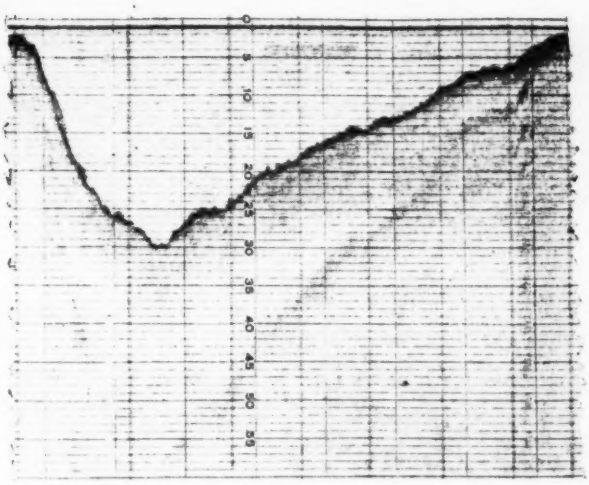
Depth recordings with this equipment are dependent upon precision timing of the velocity of sound pressure waves in water. As the equipped craft moves above the river bed, an electrical impulse, at a frequency of about 14 kc., is released by the closure of synchronized contacts in the recorder and is conducted to the transmitting oscillator in the "fish". This electrical impulse is there converted to a sound pressure wave that is projected to the river bed at the rate of approximately 4800 ft. per sec. This wave is reflected back, as an echo, to the receiving oscillator and there reconverted into an electronic impulse. The instrument accurately measures the elapsed time between the transmission and reception of this pulse and translates that interval directly into depths (in feet), which it permanently records by the arc-discharge method on specially-coated dry chart paper. The paper moves at a rate of

er Simplifies Under-Water Surveys





Above—The lid of the Bludworth Marine Recorder is hinged to permit ready access to the paper chart roll and its propulsion mechanism (left), or the electronic equipment (right). Below—A typical record (about ¾ actual depth) made by the recorder, showing river-bed profile along a cross-river course



The "fish", shown above suspended by pipe-and-steel frame outrigger, contains transmitting and receiving oscillators by which sound pressure wave is projected to river bed, and after being reflected back as an echo, is reconverted into an electronic impulse

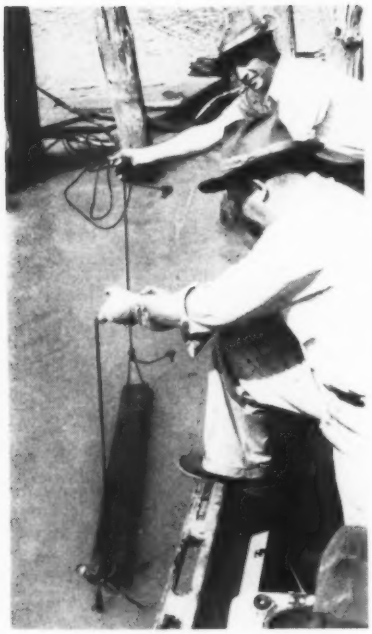
one inch per minute and will record 300 soundings in that interval.

The Missouri Pacific Lines, located as they are in many instances along the banks of the Mississippi river and two of its largest tributaries—the Missouri and Arkansas—are especially vulnerable to the ravages of these streams during periods of high water and rapid currents. Also, these and other rivers are crossed by some of the road's most important bridges, such as those at Memphis, Tenn., Fulton, Ark., Alexandria La. and the famous multiple-span Bridge 87 at Yancopin Ark.—reknowned for the buffeting it has taken from the Arkansas river, which has seemingly been undecided over the years as to just which span its main channel will flow under.

The Missouri Pacific has always considered it imperative to know the conditions of the river beds along its embankments and around bridge piers. In spite of all precautions it has seen its embankments, weakened by high water and scour, slip into rivers suddenly and without visible warning. Likewise, it has witnessed scour weaken bridge pier foundations and uncover piles until it was unsafe to operate trains over the structures involved.

Accordingly, for the last 40 or 50 years, it has taken lead soundings in waterways at all points where water troubles may occur and has kept the results as "ravine" sections. With these ravine sections as a guide, emergency soundings taken during rising river stages have proved invaluable in indicating when protective measures were needed and the amount of protection required. To keep its data on subsurface conditions up to date the road has made soundings after each flood and often during a flood.

To assist in a better understanding of the overall under-water survey problem on the Missouri Pacific, a typical survey problem is described. Every year an extensive subsurface survey is made in the vicinity of the inclines of the car ferry crossing of the Mississippi river between Thomure, Mo., and Kellogg, Ill., on the Missouri-Illinois railroad, a subsidiary of the Missouri Pacific. Although this investigation of the river bed is made primarily to determine when dredging of the ferry channel is required, and not when scour has



In making the "bar" test to insure accuracy of depth recordings, two men lower a flat steel plate to a point five feet directly below the water level. By this means the operator calibrates his chart

This view, taken from the three-track car ferry, Ste. Genevieve, shows the incline at Thomure, Mo., with its "cradle", which is mounted on car wheels so that it can be moved up or down the incline

occurred, the technique employed is the same and the area covered is even more extensive than when getting similar data at bridges and along river banks.

Locating Range Points

Before soundings can be made, range points are relocated so that data for river ravine sections can be taken between the same points as on the previous surveys. This facilitates comparison of data to determine scour or silting. As elsewhere, this preliminary survey work at Thomure is done according to an established pattern, merely tieing in local conditions and ranges to a long-established north-south grid system that is referenced to government triangulation stations. Here 11 cross-river ranges are established, and the two ferry inclines and their protecting lines of dolphins are located. Soundings are made along each range, along the center-line of each incline, and along a series of lines, 25 ft. apart, parallel with and to each side of each incline. When completed, the recording of these data gives a comprehensive picture of river bed contours in general and detailed information as to conditions in the vicinity of each incline.

An engineering party of five men performs all the work required in connection with making the underwater survey. After the party has established water lines and ranges on both shores, two of its members are left at range points on opposite shores, while the other three take to the water in a sounding craft, propelled by an outboard motor. The men located at the range points signal the sounding boat to assure that it is easily oriented on the right range.

Sounding Methods Compared

The work to this point is the same in both the old hand-lead sounding and the new supersonic depth-recorder methods. Under the old system the job was now half done—under the electronic and supersonic method it is 85 per cent complete.

Under the old hand system, as the boat pulled away from shore, it contained three men: (1) A "navigator", who handled the outboard motor and kept the boat on course; (2) a "leadsman", who cast the sounding lead and shouted the depth at each cast—a man who had to be skilled and well trained, and upon whom both the accuracy of data and speed of operation depended; and (3) a "recorder", who was generally the chief of the party. With the boat moving forward slowly, the leadsman cast his lead far enough ahead to allow it to sink to the bottom by the time the boat reached the vertical line —thus assuring an accurate reading. By the time the line was hauled in and cast again, the boat had traveled at least 25 ft.—determining the minimum distance between soundings. If the current was swift, the helmsman-navigator might not be able to keep the boat on course and would have to "come about", or circle, to keep distances between soundings uniformly spaced "on range". This took time and, unless the helmsman was as skilled as the leadsman, the accuracy of the results was doubtful. This soon became a laborious chore, and a sore-armed leadsman frequently required a "relief pitcher".

In contrast, supersonic depth recording, or echo sounding as it is sometimes called, seems almost like a pleasure jaunt. The man who was formerly the expert leadsman now operates the outboard motor, in the capacity of navigator-helmsman, as leisurely as if he were fishing; and the former navigator-helmsman now raises and lowers the "fish" into the water. The party chief operates the depth recorder. Instead of writing soundings in a notebook, this man flicks a small knob to start or stop the recording mechanism, and periodically presses the small "fix" button to mark the running chart automatically with a line that he can reference, by pencil, to any shore object the boat may be passing at the time. Manned in this way, the boat plows along at a not-so-leisurely 5 to 7 m. p. h., recording a continuous profile of the river bed on a moving straight-line chart.

Use at Ferry Crossing

At the Thomure-Kellogg ferry crossing, using echo-sounding equipment in this manner, it requires less than five hours to make a complete record of river-bed profiles, including the 11 cross-river ranges, seven runs on each side of each of the two inclines, and on the center line of each incline. To do this by hand in the past, with soundings made at 50 to 100-ft.

intervals, has required as much as 12 to 15 hours. Taking soundings every 25 ft. required twice as much time.

The "Bar" Test

Before starting actual sounding operations with the supersonic equipment, several checks are made to insure the accuracy of subsequent depth recordings. One of the most important of these is the "bar" test. This consists of having two men lower a flat steel plate or "bar", by means of cords attached to its ends, a specific distance (usually five feet) below the water level. After turning on the recording mechanism, the chief operator adjusts the "zero" of the chart so that a depth of five feet is recorded. This and other tests necessary can be made in a few minutes.

After the completion of work at any one location, the sounding party can take the equipment to the site of its next under-water investigation in either of two ways—by rail or by river. If the movement is to be made by rail, the cables connecting the recorder and "fish" are removed and coiled in the lid of the recorder in a bracket designed for that purpose. The lid is then placed on the recorder, and when battened down and locked, the instrument is ready for shipment by baggage car anywhere desired. Next, the "fish" is removed from its pipe supports, the braces of the outboard rigger are disconnected, and the entire framework is folded together into a compact, portable unit that can either be tagged and shipped separately or laid in the bottom of one of the boats. If the boats are also to be shipped by rail, they can be separated by removing a few simple fasteners.

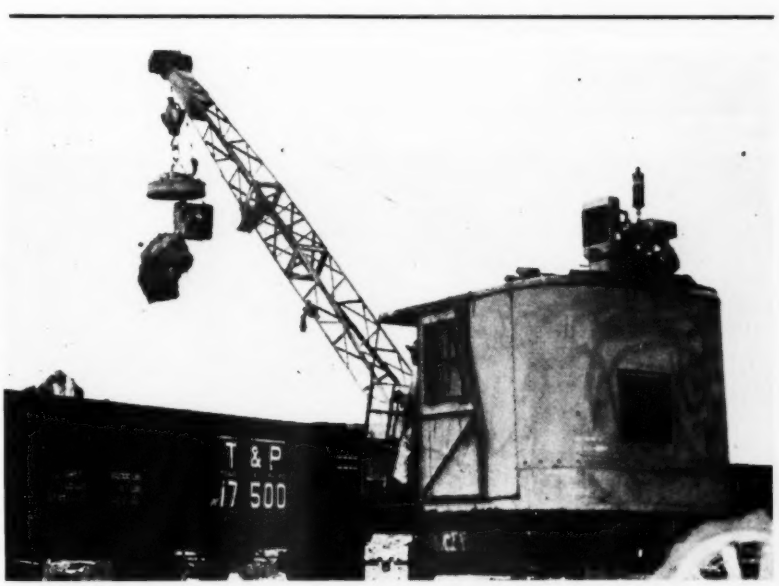
Limitations Are Few

In a year's experience with its echo sounder, Missouri Pacific engineers have found, mostly by trial and error, only a few limitations in the use of this type of equipment for railroad work. First, to get the most effective results around bridge piers, a boat with a reversible motor is almost a necessity to keep from damaging the "fish" and to stay on "range". In this connection it has also been found difficult to get soundings immediately down stream from bridge piers and when there is turbulence from the propellers of the boat.

As the velocity of the sound pressure waves are accurately timed in water, air drawn into the water by turbulence and eddy action will cause stray recordings to appear on the chart. These cannot be mistaken for the true depth, and can be recognized by their irregularity. During violent turbulences, as in runouts on the lower Arkansas river, recordings may blank out completely. When this occurs the sounding boat is held in position with the recorder running, until the water has become homogeneous and depths again appear on the chart.

Soundings have been made during emergencies with the hand line and lead, in currents up to 10 m. p. h., and although depths made in this way are subject to considerable error, they are better than no soundings at all. In taking depths by the handline method, with high velocities and deep water, the sounding boat is brought upstream of the range and stopped, the lead is let go, the leadsman "bounces bottom" as the boat drifts back onto range. Both boat and lead must drift at the same speed to get a vertical lead line, which is very seldom the case. Sounding in this way upstream from bridge piers or other obstructions is dangerous, as the boat goes out of control when stopped and drifts back. With echo depth recording equipment soundings can be taken in any current in which the boat is capable of maneuvering, and although it may be necessary to stop and hold position during turbulence, or rerun the range, these few limitations become insignificant in the opinion of those who use the equipment.

The use of the supersonic depth recorder on the Missouri Pacific culminates more than 40 years of under-water survey work under the direction of the principal assistant engineer, appropriately named W. M. Neptune, and affectionately known as "Captain" by those who have worked for him. All echo-sounding operations have been under the general supervision of R. P. Hart, chief engineer, and A. A. Miller, chief engineer maintenance of way, who retired November 1. Field work has been in charge of E. H. Daves, Jr., assistant engineer.



ELECTRIC PLANT SPEEDS SCRAP-IRON HANDLING—By installing a 5-kw. 5M511 Kohler electric plant on the roof of its crane cab to power a 36-in. lifting magnet, a Texas salvage company was able to reduce the number of man-hours required to load a gondola with 50 tons of scrap iron from 64 to 4, effecting a considerable economy in its operations. For the 36-in. magnet the 5-kw. Kohler plant supplies enough power to permit lifting as much as 7½ tons of metal at one time. It will also power a 40-in. magnet. For 45-in. or 55-in. magnets, a 10-kw. plant is available.

Heavy snowfalls, drift-forming winds, and snowslides make winter railroading near the Arctic Circle difficult and expensive. In this article the author discusses some of the snow removal problems on the Alaska Railroad and their solutions.

This half-mile long slide was cleared in 48 hr. of round-the-clock work by . . .

Left—Map of the Alaska Railroad. The northern terminus of this road at Fairbanks is only 100 mi. from the Arctic Circle. Below—Cleaning up a yard with one of the Alaska Railroad's four Jordan spreaders. These utilitarian units, useful in summer as well as in winter, economically handle the greater part of the snow removal work on this road

Big Machines Defeat

By J. J. FLEMING
General Roadmaster
Alaska Railroad

• For the past several years, nine cents out of every dollar expended by the Alaska Railroad on maintenance of way has gone for snow removal. This 470-mile long government-owned line operates a total of 539.2 miles of track. Its northern terminus at Fairbanks is only 100 miles from the Arctic Circle. From December to April, the road must combat snow and its ally—winds which whip up heavy drifts and set snowslides in motion.

Snow-removal equipment on the road consists of the following units: Four Jordan spreaders, two rotary snow plows, two Russell plows, 4 bulldozers, two Tournapulls, and four Snow-Gos. A Barber-Greene snow loader-melter, with a 12,000-gal. melting tank, was put into operation recently. It will be used in yard operations when snow is falling and before it becomes packed. All locomotives, the two rotaries, the Jordan spreaders and the Russell plows

. . . bulldozers, which scraped a trail along the top, and a . . .

. . . 125-ton rotary plow pushed by two 2-8-0 steam locomotives

Big Snow Troubles

On the Alaska Railroad

are equipped with flangers. In addition, locomotives are equipped with pilot snow plows.

Particularly troublesome is the Broad Pass area, halfway between Anchorage and Fairbanks. This section crosses the Alaska Range on a summit 2,363 ft. high. On the south slope of the range waystations are buried under the heaviest snowfalls in Railbelt Alaska. For example, on February 10, 1949 Honolulu, 24 miles south of the summit, had 80 in. Hurricane, six miles south of Honolulu, recorded a total of 75 in. Cantwell, however, only seven miles north of the summit, on the inland slope, had a snowfall of only 27 in.

Another area of considerable snowfall and wind is the Tunnel-Grandview section between Anchorage and Seward in the Kenai Peninsula. On February 10, 1949 Grandview had a total snowfall of 80 in. and Tunnel, 39 in. These stations are only six miles apart.

Snowslides can bury the right of way in a number of different places on the Alaska Railroad. The chief trouble spot, however, is the Turnagain Arm route where the track skirts the base of steep mountains for 30 mi. The track occupies a narrow man-made ledge or grade bench between the mountains and the Arm, a narrow body of water that pokes a finger eastward from Cooks Inlet.

On one occasion six slides sealed off the Portage section for two days. One of these slides, possibly the record single slide on the Alaska Railroad, covered nearly a half mile of track, extending from Mile Post 78 almost to Mile Post 78.5. In places the snow was 60 ft. deep over the track. The slide snapped off telephone poles, uprooted trees, and bowled over rocks.

Experience with this slide emphasized the value of bulldozers. With hard-packed deep snow, the bulldozers can knock the top of a slide down to rotary size. The Alaska's bulldozers are Caterpillar D-4s, D-6s, D-7s, D-8s, and HD-14s.

The procedure followed at the giant slide at Mile Post 78 was typical of this type of job. First, three bulldozers, working all night, scraped a trail across the top of the slide. The snow was extremely hard packed. Snow plummeting down a mountain is compressed to an almost unbelievable hardness. Actually, when it arrives at the base of the mountain after traveling a mile or more, it is a mass of rough white ice. The "cat-skinners" skillfully rolled up a carpet of snow and pushed it toward the edge of the water. After they had cut the trail, they returned and hollowed out the snow banks.

Ahead of them one of the road's two rotary plows was in action headed south. (This particular rotary had cleared a slide at Mile Post 79 and had moved through the area at Mile Post 78 a few hours before the big slide hurtled down.)

A slide at Mile Post 76 proved how useful bulldozers can be when used in conjunction with a rotary. The rotary tackled this slide from the north end. Two bulldozers worked on the same slide from the south end. They soon approached the rotary and helped smooth the way by cutting down the banks, by keeping snow from falling in on the rotary, and by rolling snow-carpets out of the way. This combination—a ro-

A rotary snow plow in action in the Curry yards. This type of unit is used in the yard-cleaning work when the snowfall is extremely heavy and snow is hard-packed

tary and bulldozers—apparently makes the best mechanical team for leveling big snowslides. The dozers are particularly useful when the slide is "dirty"; that is, when the snow contains dirt, rocks and trees.

After clearing the slide at Mile Post 76, the rotary went to Portage, eight miles away, turned around and returned to work on the slide at Mile Post 78. With six bulldozers and the rotary as team-mates, the slide was speedily cleaned up.

Years of experience with snowslides on the Alaska has enabled Anton Anderson, assistant chief engineer, to classify slides in the following ways:

1. **Gulch slide.** In autumn, wet sloppy snow picks up dirt and rocks which have not yet frozen tight on the mountain slopes, and topples them down into the gulches which act as chutes for the downward plunge of the mass.

2. **Slick slide.** On top of a heavy fall of snow, a slick crust or glaze may form. Newly falling snow may shoot off the slick crust in a sheet as it might off a smooth tin roof.

3. **Comber slide.** Enormous combers are formed by the wind depositing damp snow on the lee side of mountain crests. Sometime these overhanging combs extend 150 ft. over the edge of the mountain, and they can be thousands of feet long. When broken by excessive weight, these combers shoot down the mountain side with tremendous speed. Their enormous weight makes this type of slide the most dangerous. The slide often occurs after a sudden thaw.

4. **Sun slide.** The sun thawing the snow in the spring can cause a slide. On a warm day, usually from noon until about 4 p. m., the danger of this type of slide is at the maximum. The Alaska changes train-operating schedules when necessary, so that trains will not be subjected to this danger.

For snowdrifts, the rotary, ordinarily, is the most useful piece of equipment. The Alaska's second rotary is an American Locomotive Company, 212-ton unit, built in 1930. This rotary is normally stationed at Broad Pass. The other rotary is stationed at Portage. U-shaped cuts made by rotary plows fill with snow later and must be cleaned out again with a rotary. Plow or spreader types of equipment would pack the snow more solidly against the sides of such cuts, whereas the rotary can "firehose" the snow out of such slots. However, there is this problem with the rotary: Chunks of hard snow, shooting out with force from the rotary, often endanger nearby telephone pole lines.

The bulk of our snow-removal work is done by the four Jordan spreaders. They are all Type-A, each weighing 57.5 tons. Economical to operate they are useful in both winter and summer. Two of the spreaders have the high extension front and two have attachments for ditching. The ice pick attachment on the nose or middle section is useful to gouge out ice.

In fighting snow from Curry to Windy, the following procedure is normal: Early in winter when the first snow falls, the Russell plows are most useful. One of these is a 42-ton unit, built in 1944. The other was more recently acquired. As the depth of the snow increases, the railroad generally uses the rotaries for snowstorms, and the Jordan spreaders for clean-up work. The Jordan spreaders, the maintenance of way department has found, save money.

A typical operation for cleaning up heavy snowfalls in the Curry yards, a division point, is as follows:

1. Use the Jordan spreader to clear some space and make some "elbow" room.

2. Plow out a path with the spreader to the first cut of cars and then set them clear.

3. Go to the second track and pull the cut of cars in clear.

4. With the spreader, plow snow on the main line to Track 1.

5. Go to Track 1 and push the snow to Track 2.

6. Pick up the cars and send them to Track 1.

In the Curry yards, a rotary works in conjunction with the Jordan spreader. The rotary takes over the job when the snow is heavy and hard-packed.

The two 6.5-ton LeTourneau Tournapulls are helpful, particularly in yard-clearing work, to carry off the snow. The Tournapulls have been used recently to help remove heavy snow from the area around the passenger depot in Anchorage.

The four Snow-Gos, powered with six-cylinder gas engines, are truck-mounted snow plows. They are used in the yards. One is stationed at Curry, one at Anchorage and two at Whittier, one of the two ports of entry to the railbelt. A Snow-Go and bulldozers clean the unloading wharf at Whittier, which is Alaska's most modern dock installation. The Snow-Go also cleans the yard from the docks to a tunnel portal about two miles away.

In wind-swept Whittier, drifts 8 ft. to 10 ft. high are not uncommon. In both the Broad Pass and Grandview areas the fall of snow can be so heavy in 20 or 30 min. that it will halt a train. In the old days, with infrequent schedules, the Alaska kept a rotary ahead of each train. Now with the schedule stepped up considerably, this is impossible.

Safety Taught Early Forms Life-Saving Habits

By T. C. ELLIS

General Roadmaster, Atlantic Coast Line, Rocky Mount, N. C.

• To develop safe working habits among roadway employees, it is necessary that we begin teaching them safety the minute they are hired and assigned to a job. If we immediately teach an employee the safe way to do his job, safe habits will begin to form early. If knowledge can be attained by experience, then he should become safety conscious by using methods that, by the experience of others, have been proved to be safe. We all form habits of some form or another. Some of our habits may be good and some may not be good. Some may be safe habits (sane thinking), others may be unsafe habits, such as crossing railroad tracks at grade crossings without stopping, in violation of the law (in some states). You may think it is unnecessary to stop, look and listen when the lights are not flashing and the bells are not ringing, but many people are killed or injured because they have broken this law, which is nothing more than a safety rule.

The best way to develop safe habits among employees of the roadway department is to keep the subject ever active in their minds. It is not enough to ask or demand periodically that an employee work safely. Instead, you must sell him on the subject of safety so thoroughly that he will not only think safely but make every move safely. Soon he will have the habit of safety so embedded in his mind that he automatically does every job the safe way.

Safe Environment Helps

It is natural for a safe environment to stimulate safe habits. You observe your fellow worker doing his job safely. You hear that he has done the same job daily for years without injury to himself or the men working with him. This subconsciously convinces you that it pays to form safe habits in your work. Therefore, you take no chances, insuring yourself against harm by performing all your work safely, whether it is picking up a crosstie, pulling a track spike, picking up rail to be spotted in, placing tools on a push car at the end of the day, or, finally, when going home on a motor car. To get home safely to your wife and children every night you must always be on the lookout for trains,

For the last 19 years the Atlantic Coast Line has held annual meetings of its Safety Committee chairmen to discuss and plan various aspects of its safety program. This article was the author's contribution to the latest of these meetings and describes his experience in developing safety habits in the roadway department.

for obstructions on the rail, for tools which might fall from your push car. You must always be cautious at road crossings, and keep your mind constantly on that important business of working safely.

Good habits, once formed, are hard to change. Very often you hear the expression; "You can't teach an old dog new tricks". If we agree that this saying is correct, then it is of the utmost importance that, at the very beginning, each foreman and supervisor teach every young employee the safe way to perform his work, so that no unsafe habits are allowed to develop. Then, those who seem to grasp early in their work the importance of good safety habits should, in turn, impart their knowledge to those who work with them, so that all will get the benefit of their experience.

Occasionally we find a roadway employee breaking the rules of safety by sitting on the rail of a live track in front of camp cars at night. This is a very unsafe practice that should not be allowed to become a habit. Men have been killed doing this—so just don't do it! When I see one of my men doing something like that or performing work in an unsafe way, I realize immediately that I have not sold him on the idea of safety. My safety talk did not penetrate. It did not put over the idea. I didn't make a sale. Then I must start over, bringing out all the angles, to put the sale over.

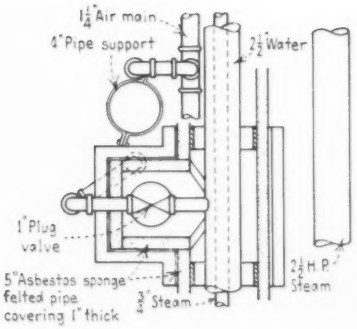
Can't Stop Thinking

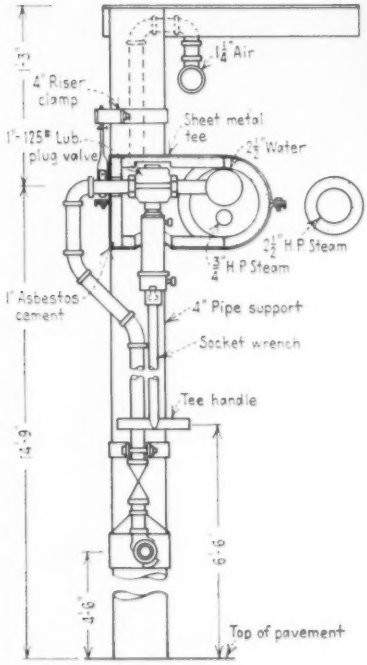
Sometimes we receive placards, sent out by the management, showing a list of "DON'TS". These don'ts were carefully thought out by someone who was thinking safety to prevent you and me from forming unsafe habits. You will find, in the case of most personal injuries, that someone failed to think. He allowed his mind to stand still just a moment until it was too late. Men often fail to think about what they are doing. They allow their minds to wander while walking across tracks, not being sure that no trains are approaching or cars being moved; they are just walking—not thinking. If men will do things like this, then it is easy to see how necessary it is for a foreman or supervisor to be always on the alert so that his men will not form careless, unsafe habits in their work.

To coordinate our safety efforts, safety meetings should be held at various points to act as clearing houses for ideas and to give each one who attends the experiences of others. We all need the benefit of these experiences, I am sure.

The rule book is a code for safety, and by complying strictly with all rules pertaining to this code, they become a habit. Form the habit of observing the rules early, and know them thoroughly so no misunderstanding will arise that might cause an injury to yourself or someone else.

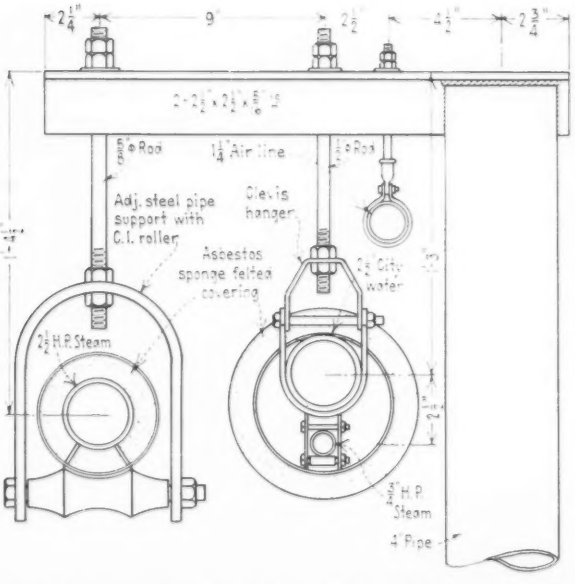
There was a time when we could "smoke 'em in", but that time has passed. The old way of "chance taking" has passed. We must have a clear understanding of the rules and instructions. Know you are right, know you are safe—then proceed.





Service platform showing the overhead steam, compressed-air and water supply lines

Shown at the left are drawings giving details of the water drop pipes and the valve enclosures. Note the precautions taken to prevent the water line and the valves from freezing in the winter



Details of the hanger assemblies for the various service lines

Coaches Watered fr

• At its Fourteenth Street coach yard at Chicago, the Chicago, Burlington & Quincy has installed a coach-watering system in which the water supply line is carried overhead to meet the sanitation requirements of the U. S. Public Health Service. With this type of installation there is no possibility of contamination of the water supply from storm or sanitary sewage. Installations of this type are preferred by the U. S. Public Health Service; however, their applicability is limited to locations with relatively wide track centers.

The opportunity of installing the overhead water-system in coach yards is limited on most railroads because of the expense of rearranging long-established coach-servicing facilities to obtain track centers of the necessary width. Such expense may include the removal and reconstruction of work platforms, the relocation of underground and overhead steam, air, and electric lines, as well as the relocation of tracks and inspection pits. At some locations, the rearrangement of existing coach-yard facilities may be further complicated by the presence of related or unrelated fixed structures. Generally, therefore, it is only where wide track centers already exist between coach tracks, or when extensive repairs or construction of other servicing utilities are contemplated, that the installation of an overhead water supply system is considered practicable.

At the Fourteenth Street coach yard of the Burlington, the opportunity of revamping the water-supply system arose when it became necessary to provide longer inspection pits for two of the tracks used for handling streamlined passenger trains. In connection with this work, a track was removed to permit a wide concrete platform for trucking purposes to be constructed between inspection pits. The project also included the relocation and shortening of several other

Dining car being serviced from one of the water drop pipes. Note ample headroom

Water supply line is carried overhead in an insulated steam-heated jacket supported on metal posts, with sufficient headroom clearance to permit the use of usual platform-type rolling equipment for servicing streamlined cars and diners. The installation has been approved by the U. S. Public Health Service which regards it as a model of design for use under similar conditions.

d from Overhead

On the Burlington

tracks, the tearing out of existing concrete platforms, the abandonment of an existing drainage line, the reconstruction of a new drain, and the relocation of other underground facilities, plus other incidental work required in revamping the coach yard for improved and convenient servicing.

Water Line Steam Heater

Included in the general improvement plan was a proposal to elevate the steam, air, and water lines and support them on metal columns approximately centered on the wide concrete platform. The water supply line, which consists of 2½-in. steel pipe and is approximately 1,040 ft. long, was connected to the city water supply. The pipe, together with a small ¾-in. high-pressure steam line, was encased in a jacket 5 in. in diameter, composed of asbestos sponge felted material, 1 in. thick, with a weatherproof covering. The sole purpose of this steam line is to heat the interior of the jacket to prevent the freezing of the water line. It is independent of a 2½-in. high-pressure steam main for coach-heating purposes, which is carried on the same column supports.

The 2½-in. high-pressure steam line, a 1¼-in. air supply line and the 2½-in. water supply main are each supported on clevis hangers suspended by rods from brackets mounted on top of the metal columns. These columns consist of 4-in. steel pipes spaced 14 ft. 2 in. apart. The ¾-in. high-pressure steam line is supported at 8-ft. intervals on roller hangers fixed to the water main. The water and steam mains provide a 14-ft. 4-in. headroom clearance over the platform, while the air supply line is 10-in. higher. This clearance permits the use on the platform of rolling scaffolds employed in servicing coaches, as well as the commissary trucks used in servicing diners.

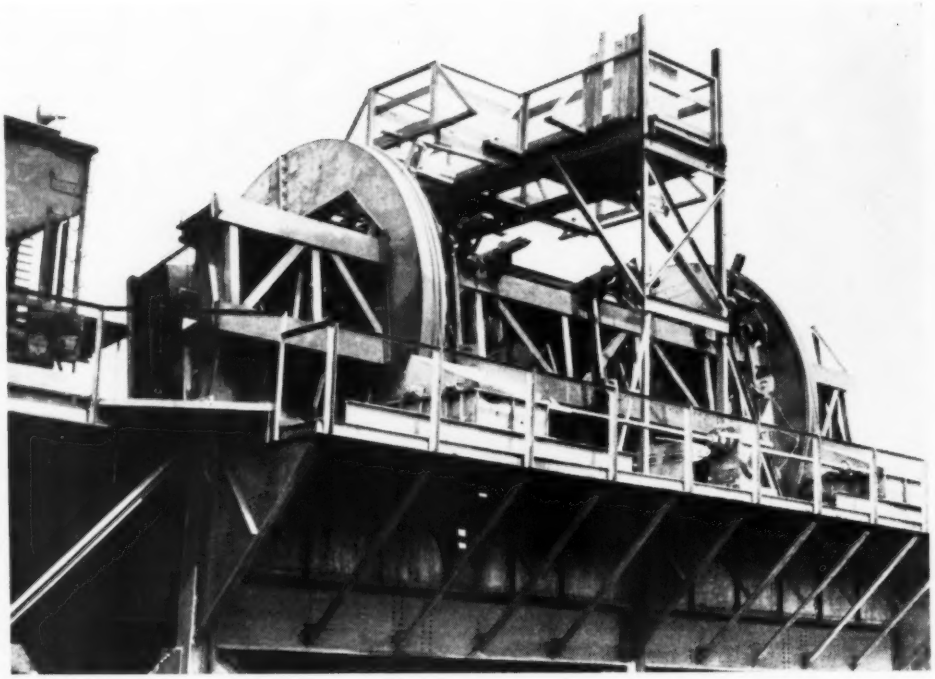
Valves and Drop Pipes

On every sixth column, at approximately car-length intervals, a 1-in. pipe with a service outlet was dropped from the water main, and a valve, operated by a socket-wrench handle extending downward to a convenient height, was placed at the top of each of these pipes. A special metal jacket, with a 1-in. layer of asbestos-cement insulation on its inner periphery, surrounds the valve to prevent it from freezing. A conventional hose connection is provided at the lower end of each drop pipe, and is protected from air-borne contamination by a light metal hood. When a hose is to be attached to the connection, this hood can be slid upward on the drop pipe to facilitate making the right-angle turn necessary for the connection. When the service hose is disconnected, the water left in the drop pipe below the valve flows out by gravity to the platform, and thence to the inspection pits where it is carried away by the drainage system provided in these pits.

Contamination Impossible

With such an arrangement, there is no possibility of the water supply becoming contaminated through back siphonage or submergence. Also, to prevent contamination of the service hose, great care is exercised by the workmen to keep it on a reel when not in use, and to keep the ends from contact with the platform when the hose is moved from one car location to another.

The overhead water-supply system at the Fourteenth Street yard was designed and constructed under the general supervision of A. H. Simon, engineer of buildings, Chicago, Burlington & Quincy, Chicago, and under the direct supervision of W. D. Gibson, water service engineer.



Showing the car dumper, manufactured by Eastern Constructors, Inc., dumping a car of material.

CAR DUMPER Speeds Grading for

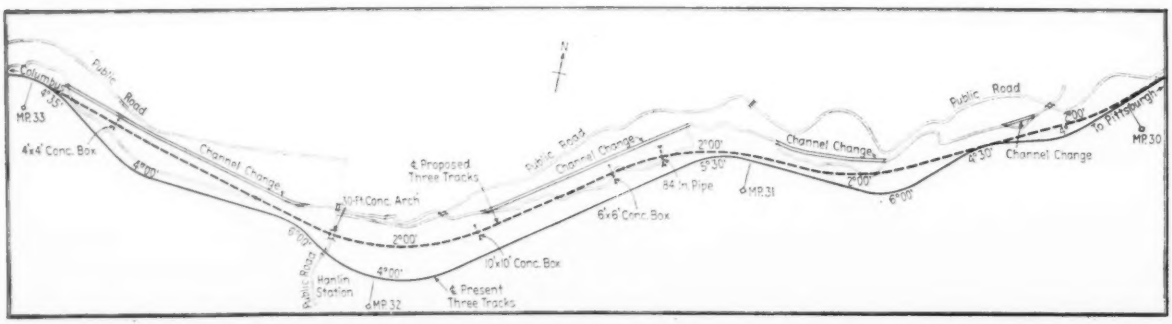
• At Hanlin, Pa., 32 mi. west of Pittsburgh, Pa., the Pennsylvania is constructing a long fill in preparation for a line-change project to reduce the relatively heavy curvature in the main line of its Panhandle division at that point. Approximately 3,000,000 cu. yd. of fill are involved in the project, the total length of which is about three miles.

The filling material is, for the most part, a waste product of the steel industry, known as granulated slag. This material, which is similar in appearance to coarse sand, is being brought to the site in hopper cars from mills at a number of points on the line, among them Pittsburgh and Sharon, Pa., Youngstown, Canton, Cleveland and Steubenville, Ohio, and Wheeling and Weirton, W. Va. Use of the slag affords the road an excellent filling material at relatively low cost as the material presents a disposal problem at the mills. Other material used in the fill is from ditching and grading projects at many points on the railroad.

Progress of the Work

Construction of the fill is progressing at a rapid rate, with about 4,000 cu. yd. being unloaded and distributed each day. To maintain this schedule, the contractor is using a car dumper which turns the loaded cars over and discharges the material into a large hopper beneath the dumper. From here it is drawn off with large-capacity dump trucks which haul it to the points of use, where it is spread by bulldozers.

The Panhandle division, extending from Pittsburgh to Columbus, Ohio, constitutes a 192-mi. segment of the Pennsylvania's main line to St. Louis, Mo. It carries a relatively heavy volume of traffic, including 23 passenger trains and an average of 56 freight trains daily. Much of the eastward



This drawing shows the location of the present line of the Pennsylvania near Hanlin, Pa., and that of the proposed line

The Pennsylvania is currently making a 3,000,000-cu. yd. fill for a proposed line change about 32 mi. west of Pittsburgh, Pa., on its line from that city to St. Louis, Mo. Mill waste and ditching refuse are being used for the fill, and are being brought to the site by rail. The contractor on this project is using a car dumper to unload this material, as herein described.

Above—Eight 13-yd. Euclid dump trucks are being used to haul slag to the fill

Right—A Caterpillar bulldozer spreading filling material at a dumping point

or Line Change

freight movement involves livestock and perishables from the Southwest. In the vicinity of the project, the line has three main tracks.

As will be seen in the accompanying map, there are seven curves in the vicinity of Hanlin, which follow in rapid succession. None of these is sharper than 6 deg., but this amount of curvature calls for a speed restriction to 40 m.p.h The new line, which will be located to the north of the present line, will have only four curves—none heavier than 2 deg. —permitting speeds up to 70 m.p.h. The grade on the new line will be 1 per cent, ascending to a summit near the east end of the project.

The new fill will vary in height up to 40 ft. Specifications call for a 64-ft. 6-in. roadway, crowned on top, to accommodate three tracks. Side slopes are 1⅝ to 1. The Pennsylvania expects no trouble with unstable roadbed on the new line because the granulated slag being used has the property of compacting solidly.

To facilitate the work, the contractor—the Duquesne Slag Products Company, Pittsburgh—built a small yard on the north side of the present line, near Hanlin station, for both loaded and empty cars. The contractor's locomotive, working at the west end of this yard, pushes the loaded cars up a "hill" track and onto the car-dumper lead where a Silent Hoist car puller is used to move them, one at a time, onto, the dumper platform. When the car is properly spotted, large hold-down clamps engage the top edges, to secure the car while it is inverted, this being accomplished by rotating the car, and the dumper track, through 180 deg. about a horizontal longitudinal axis.

After being dumped, the empty cars are pushed from the dumper by the next loaded car and move by gravity to a kick-back trestle and thence into the yard's empty tracks. A Pennsylvania yard crew brings loaded cars to the yard daily and removes the empties.

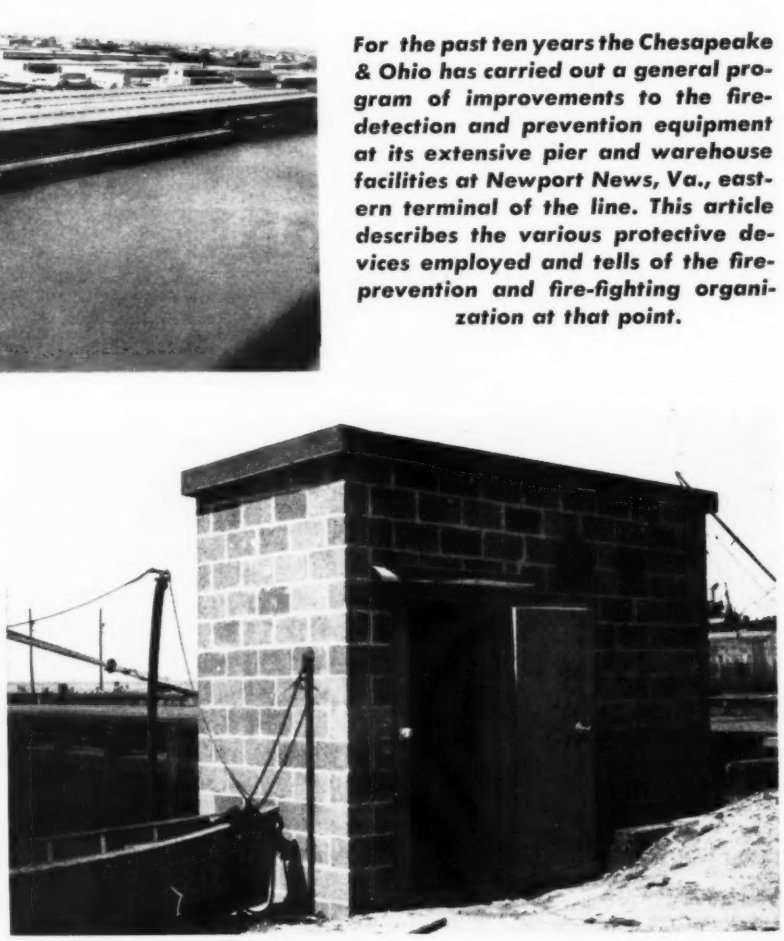
The slag from the cars is discharged into a 150-cu. yd. hopper directly beneath the dumper, from which it is loaded into 13-cu. yd. Euclid dump trucks for hauling to the points of use, where it is dumped and spread by Caterpillar bulldozers. Eight of these trucks are in operation on the project, and are loaded at the rate of one every two to three minutes, the loading time for each truck being about 20 sec.

Cars loaded with ditching refuse are inspected in the yard upon receipt and, if thought to contain large stones or similar objects, which might obstruct the hopper, are cut out and unloaded by crane into the dump trucks.

From the map it will also be noted that the work involves changing the channel of a creek at three locations, and considerable culvert work. It is expected the fill will be ready for tracklaying operations during 1950.

Minimizing the Fi

For the past ten years the Chesapeake & Ohio has carried out a general program of improvements to the fire-detection and prevention equipment at its extensive pier and warehouse facilities at Newport News, Va., eastern terminal of the line. This article describes the various protective devices employed and tells of the fire-prevention and fire-fighting organization at that point.



Above—The "Pier Area" of the C. & O.'s Newport News Terminal, a part of which is seen in this view, includes 6 merchandise piers, 18 warehouses. Right—The controls for the Suprotex sprinkler system serving each pier are located in nearby concrete-block valve houses such as the one shown in this view

• During the past ten years the Chesapeake & Ohio has been engaged in a general program involving the installation of equipment and other means to prevent, or minimize to the greatest possible extent, damage from fire at its eastern tidewater terminal at Newport News, Va., where it maintains extensive harbor facilities, including open and covered piers and a large number of warehouses. The program has included the installation of automatic sprinkler systems, complete with alarm devices which operate if the system is tampered with, as in attempted sabotage; the construction of fire curtains beneath all wooden piers; the use of draft stops in the covered piers; and the adoption of a number of other precautionary measures, including the organization of a well-trained fire brigade composed of C. & O. employees in the area.

The Newport News terminal facilities of the C. & O. include 3 coal piers, 6 merchandise piers, and 110 warehouses. The merchandise piers are of timber or iron-clad timber construction, and five are of the covered type, with large sheds above the decks to permit the temporary storage of the goods being handled to and from vessels. One covered pier serves as the train shed for the Newport News passenger station, and as the terminal for a passenger ferry operated by the C. & O. between that point and Norfolk, Va.

The 110 warehouses of wood, brick and cinder-block construction, are grouped at four scattered locations. Eighteen of these structures are in close proximity to the piers in what is generally known as the Pier area, while two other buildings, in what is known as the Brewery group, are not far away. The remainder are located at Camp Hill, 2½ miles west of the Pier area, and at Morrison, 5½ miles beyond. The Camp Hill group includes 25 buildings, while at Morrison there are 65.

Because these piers and warehouses are used either for temporary or extended storage of valuable merchandise moving through the port, it is readily apparent that a serious fire might result in extremely heavy damage. Further, the entire terminal is of great strategic importance during a national emergency, as evidenced by the fact that during World Wars I and II it was almost entirely taken over by the Army and operated as the Hampton Roads Port of Embarkation.

In 1939 the C. & O. began to modernize and extend the fire preventive equipment at this terminal and has carried this program forward steadily, depending largely on the availability of materials.

An important aspect of the mod-

e Fire Hazard at a Tidewater Terminal

ernization program has been the installation of the Suprotex automatic sprinkler system on all the timber piers, except the train shed pier, and at 58 of the warehouses. This equipment, furnished by the "Automatic" Sprinkler Corporation of America, Youngstown, Ohio, involves the usual overhead system of piping with sprinkler heads located at regular intervals throughout the protected structure.

A feature of the Suprotex system is the use of heat-actuated devices (H. A. Ds.), located at intervals of 25 feet throughout the protected structure, as the primary means of placing the system in operation. Each such device is a pneumatic thermostat and contains a diaphragm connected by means of a small air tube to a mercury check valve located in a small valve house near the protected structure. A sudden increase in temperature near one of the devices will cause the air in the H. A. D. to expand and to drive air through the tube to the mercury check valve.

Action of the valve causes a weight in the valve house to drop, in turn causing four simultaneous actions: (1) The main control valve is turned on, allowing water under pressure to enter the entire system to every sprinkler head; (2) an alarm is sounded over the city fire-alarm system; (3) a water alarm gong at the valve house is placed in operation; and (4) other horns and sirens in the area are sounded.

With water in the system, sprinkling will begin whenever the temperature at any head reaches 165 deg. F., at which temperature the sprinkler head plugs will fuse. Sprinkler heads and the heat-actuated devices are located beneath the decks of all piers and also in an overhead arrangement on the covered piers.

Another sprinkler system, known as the dry-pipe system, has been installed in 15 of the warehouses in the Morrison area. This system also employs overhead piping and sprinkler heads. When fire causes one of the heads to fuse, air contained under pressure within the pipe lines is released, causing the main water valve to open and turn water into the system. At the same time, a water-alarm gong is sounded to give warning of the fire.

As a safeguard against sabotage of the sprinkler systems, all control valves of the systems for the various piers are equipped with a special monitor valve which causes an alarm to sound if any of the valves are turned off. Also, separate cut-out valves, provided in certain lines in case of line breaks, are equipped with such alarm devices. Similar protection is provided in the warehouse area.

Looking through interior of Pier 8, the largest of the covered merchandise piers at Newport News. Protective devices at this pier include a sprinkler system, portable extinguishers, hose racks, draft stops in the roof system, below-deck fire curtains of South American Greenhart, and the liberal use of fire-retardant paint

Below-Deck Fire Curtains

One of the more recent protective measures has been the installation of below-deck fire curtains, extending across the full width of each pier at intervals of 90 to 120 feet along the length of these structures. These curtains are of South American Greenheart, an extremely dense hardwood that is highly resistant to fire, decay and the action of marine borers. They are formed of two-inch boards, bolted to the piling and soldily covered with one-inch material, and extend from the underside of the deck to a point below the low-water line.

Another recent project involved the construction of sheet-metal draft stops in the sheds of the covered piers. These stops, which consist of 16-gage steel sheets, are attached to the faces of the roof trusses and extend from the bottoms of the lower chords up to the underside of the roof sheathing, being cut to fit around the purlins. Like the below-deck fire curtains, they extend across the full width of the sheds and are spaced at similar intervals.

On Pier 8, the most recently-built covered pier, use has been made of a relatively new fire-retardant paint, known as Albi-"R", to supplement the draft stops. This material was applied to the roof truss at each draft stop and on all wood surfaces for one bay on each side, including the two adjacent trusses. In addition, it was applied on the bottom chord of every truss in the shed. (This material

Sheet-metal draft stops are provided in roof system of each of the covered piers

was described in the August, 1947, issue, page 785.—Ed.)

Of course, each pier and warehouse is provided with a generous number of hand fire extinguishers, including those of the CO_2, soda-acid, carbon tetrachloride, and foam types. Likewise, these structures are well equipped with wall-type hose racks, connected to the city water supply. In addition, every tractor, lift truck and mobile crane in use at the piers is equipped with a CO_2 or a dry powder extinguisher.

In the pier area, the city mains are connected through four booster pumps so that sufficient pressure may be maintained during a fire. Two of these pumps are electrically operated, one being arranged for remote starting by a control button located in a nearby city fire station, so that it can be started promptly when an alarm is sounded in their area. The second electric pump, and the two remaining pumps—driven by gasoline engines—are started manually by a regularly-assigned employee who reports to the pump house immediately after an alarm sounds.

The city water supply in the pier area is augmented by a reserve supply in a 350,000-gal. elevated tank. In addition, a salt-water system drawing from the river is installed throughout the area, with hydrant connections at many points. This system is operated by two steam-operated pumps and one electric pump, all located in a nearby power plant. The hydrants of the salt-water system are painted a different color than those of the fresh-water system to avoid confusion in the event of fire.

Showing a section of one of the below-deck South-American-Greenheart fire curtains

Other Protection

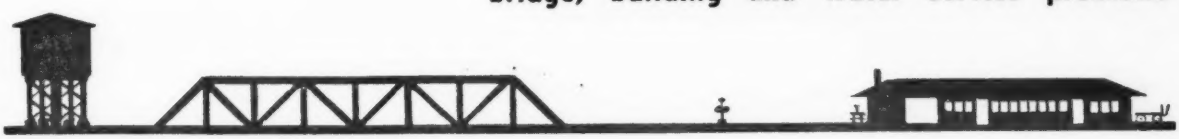
In addition to all of these fixed fire-prevention installations, the railroad provides a modern fire engine and a fire station in the heart of the pier area. This equipment, although furnished by the railroad, is manned by the city fire department and is used, when needed, throughout the city. The road also provides a fire engine at the Morrison warehouse area, but in this case it furnishes the manning detail. This unit does not answer city calls except in extreme emergency. The road has a fire brigade made up of employees and in emergencies this force uses extinguishers and emergency hose lines on the piers.

When an alarm is sounded in the pier area, the main yard office is notified at once so that power may be dispatched to remove cars from the danger area. Also, if a pier is involved, four railroad-owned tugs, equipped with both high- and low-level nozzles, are summoned by radio to assist in fighting the fire, or to aid floating equipment in moving from the danger area.

The local C. & O. organization at Newport News includes a fire marshall, several assistants and a fire prevention inspector. The latter makes monthly inspections, tests of all sprinkler systems, and checks on the various types of extinguishers that are provided. The fire prevention inspector reports to the superintendent of fire prevention, Richmond, Va., who is on the staff of the General Manager. The engineering department, under the general direction of the chief engineer, Richmond, is responsible for constructing and maintaining the water supply facilities at Newport News, with the superintendent of water supply in direct charge.

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Deciding When to End-Harden Rail

When is the best time to end-harden rail—in the mill, immediately after being laid, or sometime later? Why?

End-Harden Before Use

By R. E. CRAMER*

Special Research Associate Professor, University of Illinois, Urbana, Ill.

End-hardening at the rail mill can be done by reheating the required area of the rail by different kinds of gas burners, by electrical induction or by heating with oxyacetylene torches. Compressed air for quenching can be supplied from stationary compressors. Field end-hardening is, at present, limited to oxyacetylene heating, and the air compressor must be a portable machine.

The question of delaying the end-hardening until the scale and decarburized surface layer have been removed by some traffic does not seem advisable to the writer. The decarburized surface on rail steel usually averages 15 to 20 thousandths of an inch in thickness. The steel in this layer is not capable of developing much hardness during the quenching operation, but does not interfere with the hardening of the high-carbon steel underneath. This soft surface layer will flow to the sides of the rail head and over the rail ends or be rusted away in a few days or weeks of service. However, during this time in service some end batter may develop if the rail ends have not been previously hardened. I would prefer to have the rail end-hardened before being subjected to traffic.

After several years of field and laboratory tests of 800 rails end-hardened by four mill processes and three track processes, recommendations for end-hardening rails were printed in the Proceedings of the A. R. E. A., vol. 47, 1946, page 473. These recommendations can be met by either mill or track processes and so far as the writer has learned the results are satisfactory.

One caution should be emphasized in slotting or grinding end-hardened rails. Hardened rail steel is easily cracked when heated too fast by a grinding wheel. This is likely to happen when the grinding wheel is too fine and too hard or becomes dull from grease and dirt. The fast heating and subsequent cooling of the hard steel produces invisible heat checks which will spread into weeping cracks by the action of heavy wheel loads. I believe as many end-hardened rails have failed from poor grinding practice as from poor end-hardening.

* In charge of Rails Investigation—a cooperative project of the Association of American Railroads and the American Iron & Steel Institute Technical Committee on Rails and Joint Bars.

Harden Before Batter Starts

By C. B. BRONSON

Maintenance of Way Assistant to Vice President, New York Central, New York.

By all means, the time to end-harden rail is before traffic has passed over the track. At least this work should be done before any indications of batter have developed. It is a well known fact, sub-

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the February Issue

1. To what extent is yard cleaning necessary? How can this be done efficiently? Explain.
2. To what extent are translucent building panels adaptable for use in place of windows and for skylights in railway buildings? Explain.
3. What are the major factors involved in the distribution of ballast? What effective means or devices can be employed to secure uniform distribution?Explain.
4. What are the relative advantages of using small portable air compressors, or fixed pipe lines and permanently located air compressors for cleaning the larger bridges? Explain.
5. What is the most effective manner of protecting small roadway machines and power tools from the weather and vandalism when it is more convenient and less costly to leave them at work sites along the right-of-way? Explain.
6. Why must the salt used in the regeneration of Zeolite water softening plants conform to certain specifications?How do these specifications differ from those of ordinary rock salt used for melting snow?
7. What are the advantages and disadvantages of incising lumber and timber prior to treatment? Under what conditions is it advisable? Explain.

stantiated several times by investigators, that batter on unhardened rail ends accumulates at a rapid rate in the initial stages directly after the rail has been laid. The curve plotted for the rate of batter levels off and becomes moderate after the rail ends have become sufficiently cold rolled by the wheel loads.

It is a toss-up whether to end-harden the rails at the mill or immediately after being laid. The important point is to do the work promptly before batter can take place. There is one advantage in having the work done at the mill —it is known for a certainty that the rails will have no traffic over them until the end hardening has been done. The chief fault in field end-hardening is the tendency to delay the work. If this occurs, only partial benefit of the process for controlling or reducing batter is obtained.

Painting Asbestos-Cement Siding

Under what circumstances does asbestos-cement building siding require painting? Can this be done effectively? What precautions should be observed? Explain.

Don't Loosen Fibres

By B. M. Murdock
Engineer of Buildings, Illinois Central, Chicago

One of the reasons for the extensive use of asbestos-cement siding is the fact that it is considered more or less maintenance free inasmuch as it does not require painting for protection against the elements. The only necessity for painting this material is for special decorative purposes or where it is desired to improve the appearance of a building that has become discolored or stained.

In cases where painting is to be done, it is essential to brush the surface thoroughly to remove the dirt and loose surface fibres. This brushing should be done with care so as not to raise the fibres in the material. It is also important that paint be applied only in dry weather and over dry surfaces. The presence of moisture will prevent proper penetration and bond of the paint.

No special type or brand of paint is necessary. It can be either a rubber-base paint or one that is prepared primarily for brick or stucco work or a good regular grade of exterior house paint. In painting shingles, the paint should be applied across the middle of the shingle and rapidly brushed out in a vertical direction, following the grain. One shingle should be completed before going to the next. In the case of clapboard siding, paint should be brushed on in the direction of the grain since it dries quickly, and care must be exercised to prevent unnecessary overlapping.

Where it is desired to brighten the appearance of a building without going to the expense of painting, it is possible to remove a certain amount of dirt and stain by washing with soap and water applied with a stiff fibre brush. Where stains cannot be removed in this way, there are many cleaning compounds that can be used. It would be well to follow the directions for such work that are quite often published by the manufacturers of this material, or at least their recommendations should be obtained.

No Real Reason To Paint

By George S. Crites
Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

At times in the past coats of ill-colored paint have been sand-blasted, or otherwise removed, from brick, stone and stucco buildings to bring out their natural beauty and to avoid the cost of repainting when times might be poor. Few, if any, esthetic sensibilities were jarred by this procedure and savings were made for the future.

Discolored asbestos - cement building siding might look bad to some, but it speaks of utility and service; hence no lasting benefit would be brought about by daubing paint on such surfaces. Good asbestos-cement is more lasting than most paints under the same weather conditions.

If it is decided that some color effect other than uncolored cement is desirable for certain places or buildings, it should be obtained by coloring the asbestos-cement mix before casting into siding pieces. Any desired color can be secured in this manner and it will be lasting. It seems to me that color effects of asbestos-cement siding material should be predetermined and not be thought up after the material has been placed in service.

If Paint Needed, Use Care

By Assistant Engineer Buildings

To understand why asbestos-cement siding might require painting, it is necessary to review some of the characteristics of the material itself. Most types of asbestos-cement siding are made of Portland cement and asbestos fibres. These ingredients are mixed with water and pressed into thin slabs, either plain and smooth or marked to show the texture and raised grain of weathered wood. After fabrication, the siding is usually coated with a thin protective film of wax, designed to improve weather resistance or act as a water repellent. This film for the most part, weathers away after varying periods of time.

Such siding is quite porous, and is likely to soak up a great deal of water during rainy weather, especially after the wax coating has weathered off. Investigators have found that weathered asbestos-cement siding absorbs water at a rate varying from 1½ to 3 gal. per 100 sq. ft. of surface. Although little, if any, of the moisture that may be absorbed by side walls penetrates to the plaster side to affect the interior decoration of the building, ugly stains often remain on the exterior after the water evaporates. It is the unsightliness of these stains that makes painting desirable.

If such painting is decided upon, a few general precautions must be observed to obtain an acceptable and lasting coating. Paint experts claim that any job that

has weathered long enough to collect a lot of dirt and become badly stained will not retain any of the alkalinity which, when the siding was new, might require neutralization before painting. However, that statement does not hold true for sheltered areas beneath eaves and other protected places. Such areas should be treated with benzine before any paint is applied, and if this treatment is followed by a zinc-sulphate wash, paint adhesion will be assured and the possibility of the alkali damaging the paint film will be prevented.

The porosity of asbesto-cement siding that causes it to absorb water must be reckoned with before paint is applied. Here again our paint experts recommend that a priming undercoat be applied, using care to insure complete sealing of the surface. Before the application of the primer, good painting practice calls for the surface to be dry and clean. This can be assured if one week of sunny weather precedes the first paint application and all dirt or foreign matter is removed with a stiff-bristle brush. After the priming coat has been allowed at least a week of good drying weather, a finish coat of any good house paint can be applied to complete the work. Carefully painted asbestos - cement siding will not only look brighter, but will be protected from moisture.

Installing Low Office Partitions

What are the advantages and disadvantages of office partitions less than ceiling height? What type of construction materials are adaptable for such partitions? Explain.

Low Partitions Preferable

By L. E. Peyser

Architect, Southern Pacific, San Francisco, Cal.

The advantages of relatively low office partitions far outweigh objections to them that may be raised in favor of full-height partitions. In addition to economies in first cost, which are considerable, there is an added saving when changes in space divisions become necessary because low partitions can be constructed in sections that can be easily handled and re-erected.

Low partitions permit the installation of modern fluorescent strip or other forms of over-all lighting, regardless of floor subdivisions, thus eliminating the necessity of rearranging the individual lighting units such as might be necessary when full-height partitions are used. This applies equally to sprinkler heads if a fire-protective sprinkler system is in use.

Low partitions simplify the design and lower the cost of air conditioning installations and offer less obstruction to natural ventilation when a mechanical installation is not provided. They also present a better appearance than full height partitions as well as giving a feeling of spaciousness through visibility across large areas and in individual offices in which small areas often have unsightly proportions of height and width.

Objections may be raised to low partitions on the basis of the lack of privacy, but it is believed that this reason is not valid in a majority of cases. A normal conversation, carried on within a low partitioned area, is inaudible to persons on the outside, and visibility is impossible unless a deliberate effort is made to peep. Where absolute, assured privacy is important and there is a possibility of eavesdropping then full-height partitions are necessary. This is also the case where a considerable amount of noise is present in certain areas or quiet is necessary in others. Generally speaking, however, quiet can be assured in offices by the use of adequate acoustical materials in the ceilings.

Low partitions should preferably be about 5 ft. 6 in. high, and in no case in excess of 5 ft. 10 in. in height. The lower 3 ft. 6 in. should be of wood or hollow metal panels and the remaining height of obscure glass, preferably wire inserted. The design should be such that the glass is readily replaced by sliding it in slots with no construction member across the top. The whole plan of installation should be studied carefully so that partitions can be standardized to the fewest possible variations of unit lengths.

Many Materials Available

By A. L. Becker

Engineer of Structures, Missouri Pacific, St. Louis, Mo.

When it is desired to divide a large office space into several small private offices, it is very advantageous to install less-than-ceiling-height partitions because they do not require any change in the existing heating system, the re-arrangement of ceiling lights, or the installation of new window openings. Low partitions are also more economical to construct than ceiling-height partitions, and less difficult to relocate when changes are desired.

The two major disadvantages are: (1) Less privacy than the ceiling-height partition, because conversations can be heard if spoken in a loud tone; and (2) the noise of equipment in other parts of the room becomes a disturbing factor.

These low partitions can be constructed of masonry, metal lath and plaster, wood, metal, or asbestos-cement sheets. Such materials can be used for the full height of the partition (about 7 ft. 4 in.), or for a height of 3 ft. 6 in. above the floor, with glass above that height. Partitions with glass in the upper portion are more desirable because they afford borrowed light. In large part the choice of materials determines the cost which varies from $6 to $30 per lin. ft.

A two-inch partition made of metal lath and plaster with a wood cap and base is the most economical (costing about $6 per lin. ft.) but it is not the most desirable because it is not movable. This type of partition, with plaster 3 ft. 6 in. high and glass above, would cost about $8 per lin. ft.

A 5½-in. partition constructed of tile and plaster with a wood cap and base (also not movable) would cost approximately $9 per lin. ft. With tile and plaster 3 ft.

6 in. high and glass above the cost would be $11 per lin. ft.

A partition with a wood panel 3 ft. 6 in. high and glass above is next when cost is considered ($13 per lin. ft.) This type of partition presents an appearance of being temporary and is not too well adapted to making changes economically and quickly.

The most economical movable partition is constructed of a 1½-in. wood core having ⅛ in. asbestos-cement sheets on both sides, a base of the same material and a wood cap, without glass, and would cost $14, more or less, per lin. ft. This type presents a hard-to-mar surface. This same partition with asbestos-cement sheets 3 ft. 6 in. high and glass above would cost about $17 per lin. ft.

Four-inch partitions constructed of concealed structural members, made of No. 20 gage steel and 7/16-in. asbestos-cement sheets on both sides, are fire-resistant. Because of the range of panel widths, this type of partition is well adapted for making changes economically and quickly. The cost is approximately $18 per lin. ft. or $23 per lin. ft. with glass above the 3-ft. 6 in. level.

The metal and glass partition with glass or rock-wool core is fire-resistant and sound proof. Because of the various finishes that can be given the metal and the architecturally-designed moldings, this partition gives the most pleasing appearance of any type of construction. Its approximate cost varies from $22 to $30 per lin. ft. depending on the thickness of the partition.

All of the prices quoted are estimates based on St. Louis wages and include erection with an average of one door opening to every 20 to 25 lin. ft. of partition.

Low Cost Biggest Asset

By L. B. Curtis

Architect, Northern Pacific, St. Paul, Minn.

The main advantages of office partitions of less than ceiling height are: (1) They cost less than full-height partitions; (2) they eliminate special provisions for heating, especially if heat is supplied by overhead unit heaters; (3) they afford better natural light; (4) ventilation is better than in an enclosed space; and (5) they permit easy conversion if the arrangement is more or less temporary.

The main disadvantage of low partitions is the lack of privacy they provide. This may be especially important where the space is to be used for hearings or investigations. Other disadvantages include: (1) More noise from outside sources; (2) more dust and dirt from working areas; and (3) difficulty in bracing long partitions.

If fireproof construction is not required, stud partitions with wall board covering afford a common form of construction. Wainscots of hardboard can be used for greater durability, if desired. Where better construction is desired, non-load-bearing tile with plastered surfaces is used. Other types of construction include several good prefabricated steel units that are now available.

Elevating Flat-Yard Ladder Tracks

What are the advantages and disadvantages of elevating the outside rail of a tangent, flat-yard ladder? Under what circumstances are elevated ladders justified? How much should the elevation be? Explain.

Overcomes Curve Resistance

By Ralph O. Jenson

Terminal Superintendent, Minneapolis, St. Paul & Sault Ste. Marie, Schiller Park, Ill.

In switching cars on a tangent flat-yard ladder track having no cross elevation, the curve resistance of the turnout slows the movement of the cars. Elevating the outside rail, and thereby employing gravity to overcome curve resistance, permits cars to be switched at slower speeds. Switching at slow speeds reduces delay caused by cars failing to clear the lead track, lessens damage from cornering of cars and minimizes rough-handling damage from impacts at higher speeds. Because of these advantages elevated ladder tracks are justified wherever flat switching is performed.

In theory a cut-off car should move through the turnout with no greater deceleration than when moving on the straight ladder track. The elevation should be sufficient to overcome the curve resistance and equalize the deceleration. The actual curve resistance is, of course, a variable that depends on the condition of the rail, and other factors. It has been found that an elevation sufficient to produce a 0.2 per cent decline from the switch point to the frog point is quite satisfactory. This means approximately a 1½-in. elevation where No. 7 frogs are used. We have elevated the ladders in our Schiller Park yard in this manner and have found the operating results very satisfactory.

Elevation Rarely Justified

By R. W. Willis

Assistant Chief Engineer (Retired), Chicago, Ill.

On ladder tracks in flat freight yards (except on the receiving end of receiving tracks and the departure end of departure tracks) traffic movements are usually slow, seldom being greater than 7 m.p.h. If a car is cut loose on an unelevated ladder track with enough down grade for the car to maintain such a speed, which gives it a velocity head of about 1.26 ft., and passes through a No. 8 turnout, its velocity head is reduced about 0.3 ft. and the speed of the car is reduced to about 5 m. p. h. If the car's speed is 4 m. p. h. on the ladder, that speed would be reduced to about 2½ m. p. h. If it is moving about 3 m. p. h., it is doubtful if the car will pass through the turnout.

With a frictional resistance of 4 lb. per ton, a car going 6 m. p. h. after leaving the turnout will go about 600 ft. on level track. In cold weather cars can have a frictional resistance of over 20 lb. per ton. In such cases the additional velocity head that could be gained

by elevating the outside rail of the ladder would be negligible. If the condition is such that the engine switching the cars can not readily produce the speed desired for the cars being switched, elevating the outside rail of the ladder about 3 in. will add 3 in. more grade through the turnout and add from 1 to 2 m. p. h. to the speed of slow-moving cars after passing through the turnout.

Elevation of the outside rail of a ladder increases the frictional resistance of all car movements on the ladder. It disturbs the equilibrium of cars moving on the ladder and on the turnouts in the ladder track if the cars are moving at the usual slow speeds. Elevation is usually placed on curved track to overcome the disturbance to equilbrium produced by the centrifugal force created by high speeds on the curve. The centrifugal force of slow-moving cars is negligible. Elevating the outer rail on curves on which cars move slowly increases the frictional resistance and thereby increases the probability of derailments. In many such places where derailments have occurred, the trouble has been cured by eliminating the elevation.

In most instances, an adjustment of grades will obtain the desired acceleration through turnouts to much better advantage than can be obtained by elevating the outside rail. Obviously the least objectionable place to elevate the outside rail would be on the last tracks on the ladder, where the switch movements are fewest. However, if the last track on the ladder is used as a running track and there were many movements over it, possibility of derailment would exist. Throughout steep grades on main tracks the elevation of curves is sometimes taken out, and more often greatly reduced, to lessen the frictional resistance to slow movements going up the grades. In my opinion, the elevation of the outside rail on a ladder in a flat yard to increase the speed of cars would rarely be justified.

Cutting Off Precast Concrete Piles

What are the best methods of cutting off precast concrete piles? Describe.

Dynamite Is Effective

By E. S. Birkenwald
Engineer of Bridges, Western Lines, Southern, Cincinnati, Ohio.

Two simple methods are currently in use by railroads for cutting off precast concrete piles, one developed by the Missouri Pacific and the other by the Southern.

The Missouri Pacific method provides for cut-offs to be made by first exposing the reinforcing steel and grooving the concrete all around the pile at the desired elevation with either air or hand tools. The bars are then burned through and the head of the pile is broken off with a cable from a crane hitched close to the top of the pile. The time required per cut-off by this method is normally 25 to 30 min.

The Southern, in its desire to have the main reinforcing of the piles embedded in the caps of concrete trestle bents, found that it was a costly procedure to strip the concrete from the top of a pile after the head had been broken off. As a consequence, the following method was developed by H. C. Libby, engineer of bridges, Eastern lines, and R. T. Rumbold, supervisor bridges and buildings.

Octagonal piles are cut off in four steps as follows: (1) Drill two 1½-in. diameter horizontal holes 3 to 4 in. deep in each face of the pile at the desired cut-off line. (2) Drill a vertical 1½-in. hole in the center of the pile to a point 1 ft. 6 in. above the desired cut-off line. If a depth of more than 4 ft. is required, the hole should be started with a 2-in. diameter bit, and finished with a 1½-in. bit for the last 3 or 4 ft. (3) Place a small amount of fine dry clay in the bottom of the vertical hole, then place in the hole ¼ stick (2 in. long) of 40-per cent dynamite with a cap. Lead wires must be securely wrapped around the dynamite and brought out beyond the top of hole to a safe distance for setting off the charge. Fill the vertical hole with fine clay, gently tamping it in layers with a wood stick. (4) Set off the dynamite charge with a blasting machine or a six-volt dry-cell battery.

The effect of the explosion shatters the concrete without scattering it and permits its easy removal and the cutting of the reinforcing steel at the desired length with a torch. The tools required for the entire operation are two jackhammer drills, one for the center hole and on for the side ring of holes, and an oxyacetylene cutting torch. The time required to cut off a pile in this manner consumes about 25 to 30 minutes.

Where square piles are used, it is desirable to use 3 or 4 horizontal holes 3 to 6 in. deep in each face, drilling them approximately 4 in. on centers, and to V-groove the corners of the pile to prevent breaking below the desired cut-off line.

Chip Concrete and Burn Bars

By G. G. Thomas
Engineer of Bridges, Atlantic Coast Line, Wilmington, N. C.

A convenient method of cutting off reinforced concrete piles, after they have been driven, is to chip away the concrete and burn off the bars. The work is facilitated when power drills or paving breakers are available for the chipping. There are at least two variations of this method:

(1) Where there is a slight excess of pile length to get rid of, the concrete is chipped away from the bars piecemeal. The exposed reinforcing cage can then be cut off to any desired length above the concrete. It is often desirable to leave the longitudinal bars projecting above the top of the cut-down pile, as this arrangement develops bond between the pile and the concrete cap.

(2) Where the excess pile length is more than 2 ft., the concrete is chipped away in a groove around the pile. The groove has to be large enough to expose the reinforcing bars so they can be cut off as described above. Before

cutting the bars, a line should be hooked on to the pile head from the pile-driving machine. The bars are then cut and the severed pile head lifted clear and disposed of. In case any part of the cap form has been placed, careful removal of the cut-off pile head is necessary to prevent injury to the cap form.

Using Custom-Made Cable Slings

What advantages can accrue from the practice of supplying work trains with sets of custom-made slings designed for specific purposes, in place of slings homemade from discarded wire rope? Explain.

Homemade Slings Unreliable

By E. J. Napier

Structural Field Engineer, Canadian National, Toronto, Ont.

This question is one which we have given scant consideration, as we have always accepted the fact in our own minds that custom-made slings, especially those made for specific purposes, were thoroughly reliable. Should a custom-made sling break while in use, it is quite easy to determine the cause of failure, whereas a second-hand sling might be expertly spliced, and yet have been overstrained in previous use. Sudden failure of old wire cable is not unusual, even if the utmost precautions are taken and the most careful inspection made.

In short, the writer prefers to use custom-made slings at all times in preference to the home-made variety; first, because of the safety standpoint, which cannot be over emphasized; and, secondly, because such slings help to speed up the work due to the fact that they are better constructed and the workmen have greater confidence in them.

Teach Men Use of Slings

By Adolph Drager

M. of W. Storekeeper, Central Railroad of New Jersey, Elizabethport, N. J.

Work trains should be supplied with wire-rope slings of various sizes and lengths to handle miscellaneous loads. Many slings break because there is a tendency to overload them, causing an overstressing of the strands of the wire rope.

To overcome the overstressing of slings and to obtain the longest possible service life from them, the foreman in charge should be given adequate instructions on the correct use of such devices. Such instructions should cover the following: (1) How to measure wire rope as to size: (2) proper working loads for wire rope of various sizes; (3) proper working loads for wire rope slings at various angles; (4) how to attach wire-rope clamps; (5) minimum number of clips required; and (6) proper care of slings when not in use to prevent corrosion. He should also be instructed to inspect all wire rope slings before they are used to detect weaknesses. Using the right sling for a given load will not only be safe but will extend the service life of all slings.

Slings made from discarded wire rope can be used for many purposes. Care must be taken, however, to see that the wire rope is thoroughly examined, and no sling is made from defective rope. It is also important that the wire rope be well lubricated when not in use to prevent corrosion. If homemade slings are used, foremen should see to it that all workmen move a safe distance away from the load when it is lifted as there is always a possibility that the old slings may fail while a load is being lifted.

Selling Surplus Water Facilities

In the event of complete Dieselization of a divsion or an entire railroad, to what extent can unneeded water facilities be sold to industries, farmers, communities or other outside parties? Cite examples of such sale.

Don't Abandon Hurriedly

By Water Service Engineer

We, who work with water service problems day after day, are often likely to take them as a matter of course. While concentrating on the details of keeping water service facilities and employees working at optimum efficiency, we may lose sight of the full import of our over-all job—especially its magnitude.

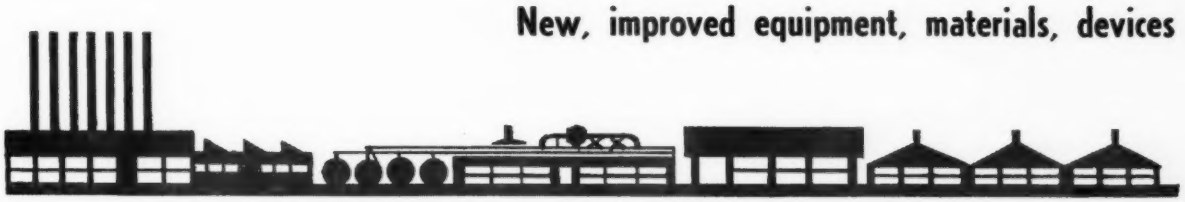
That fact was brought forcibly to my attention recently when we were studying means of disposing of water facilities that would be no longer needed after one of our divisions became completely Dieselized. The facilities that were soon to become surplus have furnished water for steam locomotives ever since the line was built in the early part of the century. They are capable of supplying a total of almost 1½ million gallons of water a day—enough for a city of 30,000 people—and are served by 76 mi. of pipe lines.

That's a lot of water anywhere, but in the territory served by this division, where the weather is hot and the drouths are long, it means more than it might elsewhere.

Consequently, we are now in the process of disposing of our surplus water facilities at 13 points in three states—all to private parties. Although these facilities will be a boon to people in our dry area, there are few towns, in any section of the country, that cannot make good use of additional water facilities either for standby service, for fire protection, or for industrial use. Therefore, it would seem advisable, for any railroad expecting to have surplus water facilities because of Dieselization, to investigate all possible prospects who might need additional water supplies—and abandon such facilities only as a last resort. Above all, consultation with the industrial department may reveal that the very water facilities previously thought surplus may be the determining factor in bringing an important new industry to your railroad.

PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices



For additional information on any of the products described in these columns, use postcards, page 1151)

CORROSION RESISTANT COATING FOR RAILS

THE Rinshed-Mason Company, Detroit, Mich., is introducing a corrosion-resistant product, consisting of a primer and a finish

Applying R-M to rail by a special device developed for this purpose

coating, which, when applied to rails, protects them against corrosion. This is a flexible material with high adhesive qualities and is reported to retain its flexibility under severe temperature variations in the weather. It is also said to possess substantial resistance to abrasion. The product is known as R-M. The finish coat is identified as No. X-8352 and the primer, No. X-8351.

The material is specifically designed for use on rails in tunnels. However, it is also applicable in other locations where corrosion problems exist, such as in some trainsheds, on tracks running close to salt water, on rails exposed to brine drippings from refrigerator cars, and at highway grade crossings.

Ease of application is one of the features of the material. Both the primer and finish can be either sprayed or brushed on rails. Also, either may be thinned for dipping, if desired.

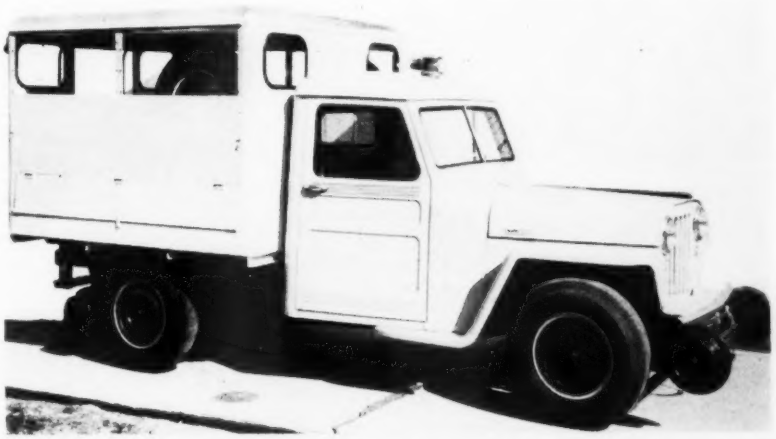
The finish has been in service under actual field conditions since the fall of 1948, having then been applied to rails in tunnels of the Great Northern in Montana and Washington. To date no breakdowns have been reported at these locations. More recently, the material has been used to protect newly-laid continuous welded rails in the Cascade tunnel of the Great Northern.

HY-RAIL MOTOR CAR

FAIRMONT Railway Motors, Inc., Fairmont, Minn., has announced a new motor car, known as the Hy-Rail, for transporting men and equipment either on the track or on the highway, as desired. It is a pneumatic-tired vehicle with hydraulically-controlled, flanged guide wheels which, in track operation, serve to position the car on the rails. When operated on the track the full load is normally carried on the pneumatic tires for better traction and better riding qualities. In case of emergency, however, the guide wheels have ample strength to carry the full load.

The motor car can be removed from the track quickly and easily by one man. To do so, the operator, from his seat in the cab, unlocks the steering wheel, raises the guide wheels and drives off the rails. Grade crossings are the ideal set-off locations. However, the car has ample power to climb over the rails and, therefore, can be set off between crossings, if necessary. Each unit is equipped with re-railers by means of which it can be set on the track between crossings.

The car has a 4-cylinder, 63-hp. Willys-Overland engine with a transmission having three speeds forward, one in reverse and an auxiliary low gear. Either two-wheel or four-wheel drive is available. The on-track mechanism, hydraulically controlled by levers in the cab, consists of a contin-



The Fairmont A30 Series A Hy-Rail work car for either on-track or off-track transportation

For additional information on any of the products described on this page, use postcards, page 1151)

The Fairmont Hy-Rail car is available with a station-wagon type of body as shown here. This model is known as the A31 Series A inspection car. Although not equipped with the flanged wheels, this particular unit is pictured here to illustrate the second type of body that available as a Hy-Rail Car

uous pump, valves, pressure gage, guide wheels, supports and a manual steering-wheel lock. The hydraulic valves have mechanical locks to hold them in an extended position when the guide wheels are down.

The car is available in two models. One of these, known as the A 30 Series A work car, is equipped with a fully-enclosed cab and an aluminum body with safety-glass windows, front and rear, and roll curtains for side openings and rear door opening. The cab and body are connected with a speaking tube. This model has seating space for 10 men, a load capacity of 2,200 lb. and net weight of 4,400 lb.

The other model, known as the A 31 Series A inspection car, is equipped with an all-steel, station-wagon type of body with seating space for six men and a space for luggage and other equipment at the rear.

IMPROVEMENT MADE IN POWER BALLASTER

THE Pullman-Standard Car Manufacturing Company, Chicago, has announced that an important mechanical improvement has been developed for application to its Power Ballaster. This improvement is in the form of a device by means of which the weight of the forward part of the machine, instead of being transmitted through the front wheels onto untamped track about 5 ft. in advance of the last tamped tie, as with present models, bears on the rails only a few inches ahead of the last tamped tie.

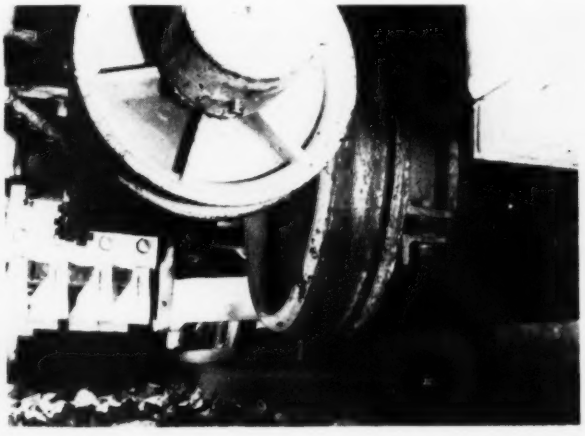
By thus removing the load of the machine, and the consequent vibratory action, from the untamped track underneath the front wheels it is expected that a higher degree of perfection will be secured in the finished track. It is anticipated that the improvement will be particularly advantageous on jobs involving the raising of the track, since it is expected to obviate the need for supporting the track on jacks until the Power Ballaster has passed over it.

The improvement in the Power Ballaster consists of the provision of an 8-in. flanged dolly at each rail at about the location of the tamping crosshead and only about 18 in. ahead of the last tamped tie. The dolly at each rail is attached at the lower end of a vertical tubular member that terminates at its upper end in a toggle arrangement that is actuated by an air cylinder. Except when the Power Ballaster is actually in use tamping ties the dollies are in the raised position and do not bear on the rails.

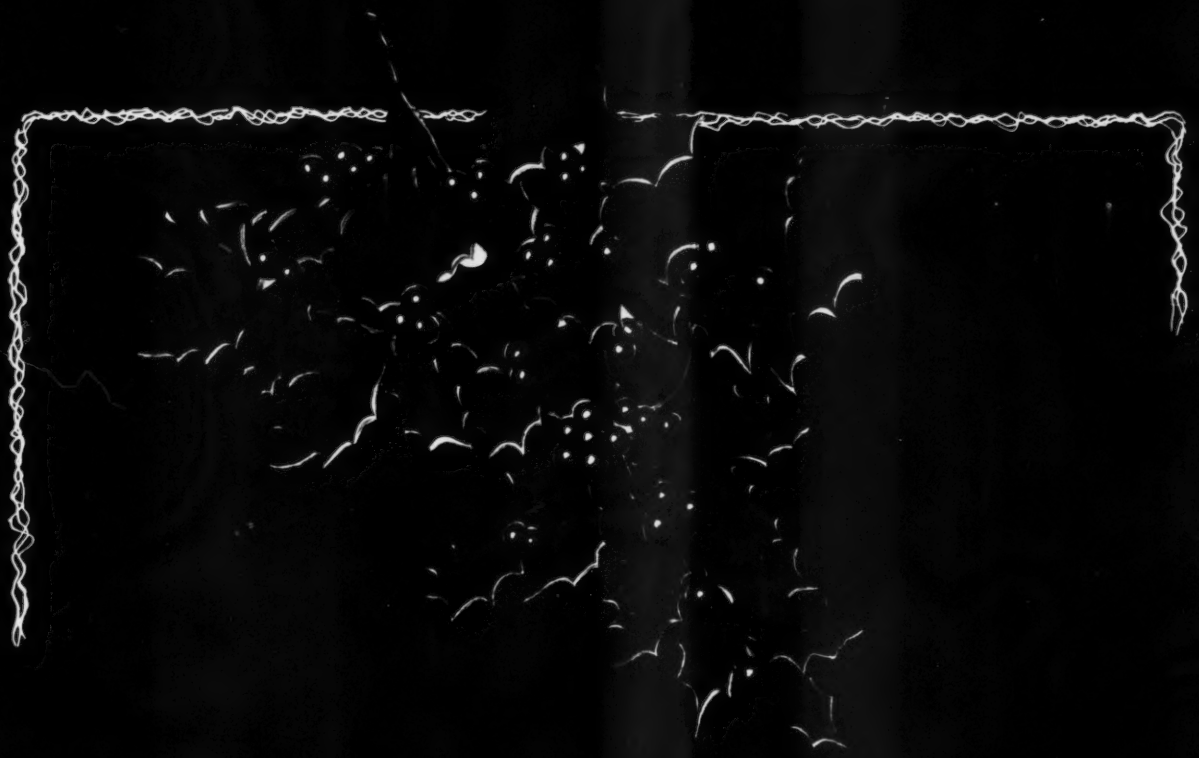
To prepare the machine for the tamping operation the forward wheels are raised clear of the rails by the air-actuated jack that is provided for use when removing the machine from the track. The air cylinder on the toggle of each dolly is then used to bring the tubular member into the vertical position where it is locked. The effect is to drop the dolly wheels to a lower position, so that, when the front end of the machine is lowered until the dollies come into contact with the rails, the treads of the forward wheels clear the rails about ¼ in.

(Continued on page 1204)

Although they are not visible, this Power Ballaster is equipped with the dolly wheels for taking the load off the machine's front wheels



Close-up of one of the front wheels of the machine shown at the left. Note that the wheel is not bearing on the rail. Dolly wheel in background is taking the load



HOLIDAY GREETINGS *from*

WOODINGS FORGE & TOOL CO.

WOODINGS-VERONA TOOL WORKS

VERONA, PA. • CHICAGO, ILL.

For additional information on any of the products described on this page, use postcards, page 1151)

The dolly wheels will not only be standard equipment for Power Ballasters to be manufactured in the future but may also be applied to machines already in use.

FINDS RAIL DEFECTS WITHIN JOINT LIMITS

SPERRY Products, Inc., Danbury, Conn., has announced an ultrasonic inspection service for locating rail defects, including bolt-hole cracks, within the limits of the joint bar, this service to be in addition to its regular rail-inspection service. The new service will utilize ultrasonic test equipment of special design, which functions on somewhat the same principle as that used in testing locomotive axles and crank pins for hidden defects.

Two types of ultrasonic detector cars are employed. One is intended for use at locations where the density of traffic is such as to require frequent removal from the track. This unit is completely manual in operation, being pushed from joint to joint by hand, and testing is consecutive for one rail only. Light in weight, the unit may be removed from the track readily by the operator.

The other type of car is designated as a semi-automatic unit. In this car the testing equipment is mounted on a pivoted carriage at the rear of a motor car, which also supports a seat for the operator, permitting rapid change from one rail to the other while testing. This car moves by its own power from one joint to another and is reported to stop automatically in the proper positions for testing at each joint.

How Defects Are Located

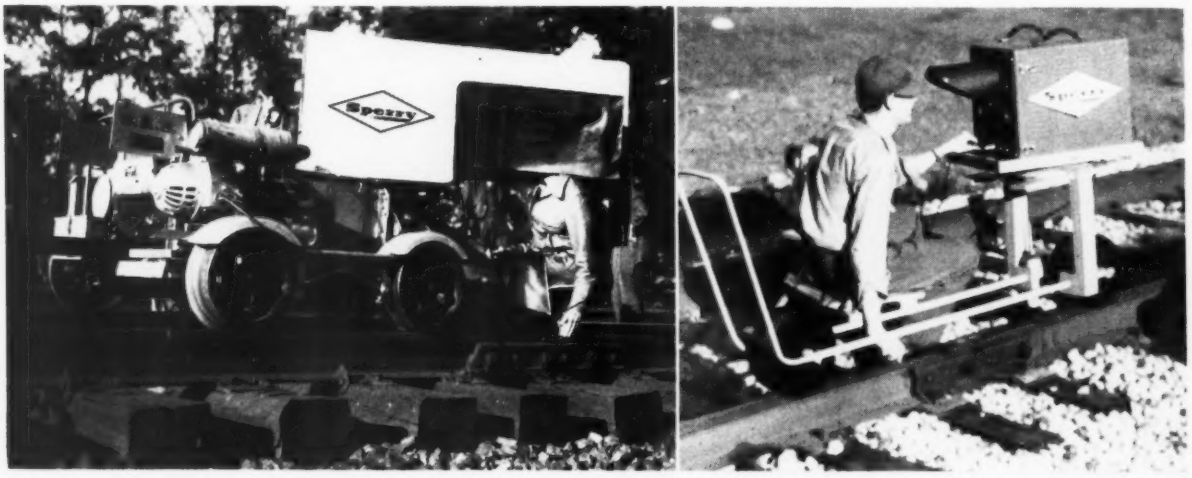
Both cars employ identical ultrasonic testing equipment, including a portable alternating-current generator for supplying the testing power. Defects are located by the transmission of pulsed ultrasonic vibrations from a searching unit directed into the top of the rail. The vibrations travel in a beam through the rail when there is no discontinuity. An interruption, such as a bolt hole, bolt-hole crack, or other defect, is said to reflect a portion of the ultrasonic beam back to the searching unit and these reflections are visually indicated on the screen of the test equipment in such a manner as to show the location of the defect, and its size as well. These can be classified by the operator as to type, including bolt-hole cracks, head and web separations, and split webs. Demonstrations of the new ultrasonic inspection service for locating rail defects are offered to all railroads.

LO-HEAD CRANE BLOCK

THE American Hoist & Derrick Co., St. Paul, Minn., has announced a new American Lo-Head crane block which, because of its shorter overall length, permits lifts from 1½ ft. to 2 ft. higher without lengthening the boom.

The new American Lo-Head crane block for all types of hook work

The forged hook operates on Timken tapered roller bearings and the cast-steel sheaves are equipped with Hyatt Hi-Load bearings. The crane block is equipped with Alemite fittings for standard grease gun lubrication which is said to be necessary only once every 2,000 hr. The block is available in capacities from 10 tons to 50 tons.



Left—The Sperry semi-automatic ultrasonic detector car tests both rails of a track and stops automatically at the proper point for testing. Right—The manual detector car tests one rail at a time and is moved from joint to joint by hand

THE MONTH'S NEWS

Happenings among the railways — the associations — the suppliers

Changes in Railway Personnel

W. S. Lacher To Retire

Walter S. Lacher, secretary of the American Railway Engineering Association for the last 12 years, with headquarters at 59 E. Van Buren street, Chicago, will retire from that position on March 31, 1950, at his own request. As his successor, the Board of Direction of the association has elected Neal D. Howard, editor of ***Railway Engineering and Maintenance*** and western editor of Railway Age. Mr. Howard will assume his new duties on April 1.

General

A. Matthews, Jr., transportation inspector on the New York Central at Syracuse, N. Y., whose early railroad experience was in the maintenance of way department, has been appointed transportation assistant to the vice-president, with headquarters at New York.

Engineering

J. M. Fair, assistant chief engineer maintenance of way of the Central region of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been granted a leave of absence, effective November 1, pending his retirement December 31.

C. M. Kern, supervisor of track on the Chesapeake & Ohio, with headquarters at Gordonsville, Va., has been promoted to assistant division engineer of the Huntington division, at Huntington, W. Va., succeeding **G. O. Mayer,** whose transfer to the Russell division was noted in the September issue.

P. H. Croft, division engineer on the Illinois Central at Chicago, has been promoted to assistant engineer maintenance of way, with headquarters at Memphis, Tenn., succeeding **J. C. Jacobs,** who has been transferrd to Chicago. **C. E. Weller,** supervisor of track at East St. Louis, Ill., has been promoted to division engineer, Chicago Terminal, succeeding Mr. Croft.

W. N. Young, chief engineer of the Lake Front Dock & Railroad Terminal Company, Toledo, Ohio, has been appointed special engineer on the Baltimore & Ohio, with headquarters at Baltimore, Md.

L. W. Moss, assistant division engineer of the Western division of the New York Central, at Chicago, has been promoted to division engineer of the Ohio Central division, at Columbus, Ohio, succeeding **G. H. Smith,** who has retired after 46 years' service. **C. L. Nolan,** supervisor of track of Subdivision 18, Western division, Englewood, Ill., has been promoted to assistant division engineer to succeed Mr. Moss.

J. P. Ensign, whose appointment to assistant chief engineer of the Pittsburgh & Lake Erie and the Lake Erie & East-

J. P. Ensign

ern, with headquarters at Pittsburgh, Pa., was announced in the November issue, was born on June 7, 1898, at Easton, N. Y. He graduated in civil engineering from Union College, Schenectady, N. Y., in 1922, and entered railroad service on May 14, 1923, as a rodman on the Electric division of the New York Central. Mr. Ensign was promoted to assistant supervisor of track on the same division on September 1, 1926, and was promoted to assistant division engineer of the Eastern division, on September 1, 1933. On July 1, 1938, he became assistant engineer track, lines East, and on July 1, 1940, he was appointed supervisor of track, Electric division. He was promoted to engineer maintenance of way of the P. & L. E. and the L. E. & E. in 1942.

John Ayer, assistant engineer of capital expenditures for the Denver & Rio Grande Western at Denver, Colo., has been promoted to assistant chief engineer at that point. He is succeeded by **Bert Byars,** chief clerk in the engineering department at Denver.

Richard A. Bardwell has been appointed engineer of tests for the Chicago & Eastern Illinois, with headquarters at Danville, Ill. For the past 12 years Mr. Bardwell has been service engineer for the National Aluminate Corporation in charge of water treatment on the C. & E. I., Chicago, Indianapolis & Louisville and Toledo, Peoria & Western.

O. M. Barlow, division engineer, Western division, of the Southern Pacific, with headquarters at Oakland Pier, Cal., has retired, at his own request, after more than 41 years of continuous service. Succeeding Mr. Barlow is **G. E. Stewart,** division engineer at Portland, Ore., who has been replaced, in turn, by **H. M. Williamson,** assistant division engineer at Portland.

Bruce G. Anderson, instrumentman on the Great Northern, with headquarters at Great Falls, Mont., has been promoted to division engineer of the Butte division, with the same headquarters, succeeding **William A. Webber,** whose death is reported elsewhere in these columns.

John S. McBride, chief engineer of the Chicago & Eastern Illinois until March 1 of this year, and subsequently chief engineer consultant, with headquarters at Chicago, retired from active service, on November 30. Mr. McBride was born at Louisville, Ky., and graduated from the Rose Polytechnic Institute, receiving his B. S. degree in civil engineering in 1905. He joined the C.&E.I. in June of the same year as an instrumentman, subsequently serving as resident engineer and assistant on

(Continued on page 1208)

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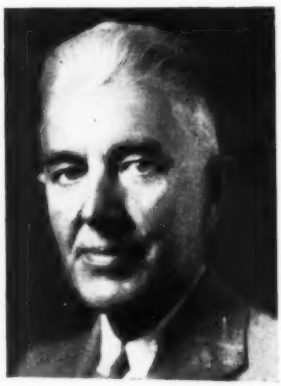
MEXICO D. F.

engineering corps until 1908, at which time he was appointed assistant engineer. In April, 1914, Mr. McBride was advanced to valuation engineer, being in charge of various phases of construction and maintenance from 1919 to 1931, at which time he was promoted to chief engineer. In 1949 Mr. McBride was appointed chief engineer consultant, the position he held at the time of his retirement. Mr. McBride has been active in the affairs of the American Railway Engineering Association and served as a director of the association from 1946 until March, 1949.

G. R. Doull, engineer of bridges of the Atlantic region of the Canadian National, has been promoted to principal assistant engineer of that region, with headquarters as before at Moncton, N. B. Mr. Doull succeeds **A. S. Gunn,** who retired on November 1. **J. C. King,** assistant engineer of bridges of the Central region, at Toronto, Ont., has been promoted to engineer of bridges at Moncton to replace Mr. Doull. **R. K. Delong,** roadmaster at Sydney, N. S., has been promoted to division engineer of the Moncton division, with headquarters at Moncton, succeeding **H. B. Titus,** who has been transferred to the Halifax division at Halifax, N. S. where he replaces **A. Scott,** who retired on October 1.

Albert A. Miller, chief engineer maintenance of way and structures, of the Missouri Pacific, with headquarters at St. Louis, Mo., has retired after more than 47 years of railroad service, 40 years of which were spent with the M. P. The position of chief engineer maintenance of way and structures has been abolished and the jurisdiction of **R. P. Hart,** chief engineer, has been extended to include maintenance of way and structures. The title of **P. P. Wagner,** assistant chief engineer, has been changed to assistant chief engineer, construction, and that of **A. B. Chaney,** assistant engineer maintenance of way, to assistant chief engineer, maintenance.

Joseph L. Fergus, whose appointment as assistant chief engineer of the Nashville, Chattanooga & St. Louis at Nashville, Tenn., was reported in the October issue, was born at Bellefontaine, Ohio, on June 20, 1890 and attended Hamilton (Ohio) High School and Ohio State University. He began his railroad career with the Wasioto & Black Mountain (now part of the Louisville & Nashville) at Poorfolk, Ky., as rodman and masonry inspector, and subsequently served on the North Fork extension of the Lexington & Eastern (now also part of the L. & N.) on construction. In 1912 he was appointed instrumentman and assistant resident engineer on reconstruction and double tracking of the L. & N., with headquarters at Athens, Ala. He was next engaged in trestle elimination on L. & N. branch lines and on grading for yard extensions at Lebanon Junction, Ky., and between Louisville, Ky., and Cincinnati, Ohio, becoming assistant engineer on the Chattanooga division of the N. C. & St. L. at Nashville in 1915. Mr. Fergus later served for short periods as supervisor of track, resident engineer and assistant engineer, real estate department, and in 1919 became assistant engineer at Chattanooga. He was advanced to division engineer at that point in 1925, which position he held until his recent appointment.



Joseph L. Fergus

L. H. Powell, assistant to chief engineer, system, Atchison, Topeka & Santa Fe, with headquarters at Chicago, has been promoted to chief engineer of the road's Coast Lines with headquarters at Los Angeles, Cal., succeeding **Milton C. Blanchard,** whose retirement was reported in the November issue. Succeeding Mr. Powell is **R. H. Beeder,** district engineer, Eastern District, Eastern Lines, at Topeka, Kan. who is being replaced by **H. E. Wilson,** district engineer of the Coast Lines at Los Angeles. The jurisdiction of **R. E. Chambers,** also district engineer at Los Angeles, has been extended to include the entire Coast Lines.

Changes on the Pennsylvania

Effective November 1, four operating divisions of the Pennsylvania were consolidated into two new divisions, two other divisions were absorbed by exising divisions, and two general superintendents' divisions were abolished. The following engineering staff changes have been made as a result of this reorganization:

J. C. Poffenberger, engineer maintenance of way of the former Lake general division, now abolished, at Cleveland, Ohio, has been appointed assistant to the chief engineer maintenance of way of the Central region, at Pittsburgh, Pa. **C. W. Van Nort,** engineer maintenance of way of the former Central Pennsylvania general division, also abolished, at Williamsport, Pa., has been transferred to the Western Pennsylvania division, at Pittsburgh, succeeding **C. R. Bergman,** who has been appointed division engineer of the newly-formed Lake division, into which the former Cleveland and Erie & Ashtabula divisions have been consolidated. **J. P. Zearley,** division engineer of the Cleveland division, has been transferred to the Indianapolis division, at Indianapolis, Ind., while **W. A. Trimble,** division engineer of the Erie & Ashtabula division, has been appointed assistant division engineer of the Lake division, with headquarters at Cleveland. Mr. Zearley replaces **W. N. Myers,** who has been appointed assistant division engineer of the Middle division, at Altoona, Pa., replacing **P. S. Settle,** whose appointment as supervisor of track is noted elsewhere in these columns.

The former Williamsport and Wilkes-Barre divisions have been consolidated into a single division to be known as the Susquehanna division, **J. E. Vandling,** superintendent of the Williamsport division, has been appointed division engineer of the Susquehanna divison, with headquarters remaining at Willamsport, Pa. **K. A. Werden,** division engineer of the Williamsport division, has been transferred to the Delmarva division, at Cape Charles, Va., while **C. F. Parvin,** division engineer of the Wilkes-Barre division, has been appointed assistant division engineer of the Susquehanna division, with headquarters at Williamsport. Mr. Werden replaced **C. R. Uitts,** who has been appointed assistant engineer on the Philadelphia Terminal division at Philadelphia, Pa.

The former Logansport division has been abolished and its territory divided between the Columbus division and the Chicago Terminal division, the latter to be known hereafter as the Chicago division. **J. W. Buford,** division engineer of the Logansport division, has been transferred to the Toledo division, at Toledo, Ohio, replacing **J. E. Chubb,** who has been appointed assistant division engineer of the Columbus division, a newly-created position.

The former Monongahela division has been consolidated with the Pittsburgh division. **W. T. Hammond,** division engineer of the Monongahela division, has been transferred to the Buffalo division at Buffalo, N. Y., replacing **R. H. Meintel,** who has been appointed assistant division engineer of the Pittsburgh division, also a newly-created position.

J. S. Albright, special engineer, has been appointed assistant to the chief engineer maintenance of way of the Central region, and **F. R. Rex,** assistant to the general manager of the Central region, has been appointed assistant to the chief engineer of that region, with headquarters as before at Pittsburgh.

In an item in the November issue, relative to the consolidation of the Grand Rapids and Fort Wayne divi-

sions, it was incorrectly stated, due to a typesetter's error, that **W. C. Gretzinger** had been appointed division engineer of the enlarged Fort Wayne division. Mr. Gretzinger's correct title is that of assistant division engineer of the Fort Wayne division, with headquarters at Grand Rapids, Mich.

Track

L. E. Brault, assistant supervisor of track on the Illinois Central, with headquarters at Carbondale, Ill., has been promoted to supervisor of track, with the same headquarters, succeeding **J. H. Megee,** who has been transferred to East St. Louis, Ill., Mr. Megee succeeds **C. E. Weller,** whose promotion to division engineer is noted elsewhere in these columns.

L. D. Schuster, assistant supervisor of track on the New York Central at Ashtabula, Ohio, has been promoted to supervisor of track at Bucyrus, Ohio, succeeding **G. V. Holm,** who has been transferred to Chicago. Mr. Holm succeeds **C. L. Nolan,** who has been promoted to assistant division engineer at Chicago, as noted elsewhere in these columns.

Frank C. Hajek, engineering draftsman in the chief engineer's office of the Chicago & North Western, has been promoted to roadmaster, with headquarters at Norfolk, Neb., effective October 1, succeeding **M. L. Fox,** whose death is noted elsewhere in these columns. **N. H. Mass,** assistant roadmaster of Subdivision 1 of the Galena division, at Chicago, has been promoted to roadmaster of Subdivision 2, with headquarters at Proviso, Ill., effective November 10. **John A. Wilkinson,** roadmaster at Proviso, has been transferred to Subdivision 1 of the Galena division with headquarters at Chicago, succeeding **John E. Wilkinson,** who has retired, effective Novmber 1.

P. S. Settle, assistant division engineer of the Middle division of the Pennsylvania, at Altoona, Pa., has been appointed supervisor of track on the Eastern division at Canton, Ohio, where he replaces **M. H. McCully,** who has been transferred to Mt. Morris, N. Y., on the Buffalo division. Mr. McCully replaces **H. A. Markert,** who has been assigned to other duties. These changes resulted from the consolidation of territories described more fully elsewhere in these columns.

G. S. Lehman, junior engineer on the Pittsburgh division of the Pennsylvania, has been promoted to assistant supervisor of track on the Williamsport division, with headquarters at Lock Haven, Pa., where he succeeds **R. A. Jones,** who has been transferred to the Maryland division, at Baltimore, Md., replacing **H. T. Roche,** who has resigned.

(Please turn to page 1210)

Railway Personnel (Cont'd)

Frank Chiodo has been appointed roadmaster on the Grand Junction division of the Denver & Rio Grande Western, with headquarters at Green River, Utah, succeeding **E. H. Waring,** who has been transferred.

Bridge and Building

C. J. Alexander has been appointed assistant bridge and building master of the Belleville division of the Canadian National, with headquarters at Belleville, Ont.

J. Hammond, bridge and building master on the Canadian National, with headquarters at Saskatoon, Sask., retired recently after 34 years' service.

E. S. Chaffin has been appointed supervisor of bridges and buildings of the Norfolk division of the Norfolk & Western, with headquarters at Crewe, Va., succeeding **A. C. Tinsley,** whose death is noted elsewhere in these columns.

E. N. Haase, assistant supervisor of structures on the Denver & Rio Grande Western, at Pueblo, Colo., has been promoted to supervisor of structures, with headquarters at Salt Lake City, Utah, succeeding **A. C. Black,** who has been transferred to Grand Junction, Colo., to replace **B. Schneitman,** who has retired. **James O. Born** succeeds Mr. Haase as assistant supervisor of structures at Pueblo.

Special

George E. Buckley, Jr., has been appointed supervisor of fire prevention on the Southern, with headquarters at Knoxville, Tenn.

D. S. Cowperthwaite and **Anthony Kennedy** have been appointed district supervisors of work equipment on the Erie, with headquarters at Susquehanna, Pa., and Meadville, Pa., rspectively.

Obituary

W. J. Tyers, retired bridge and building master on the Canadian National, died recently at Belleville, Ont., at the age of 81.

William A. Webber, division engineer of the Butte division of the Great Northern, with headquarters at Great Falls, Mont., died on November 2, after serving this road for 22 years.

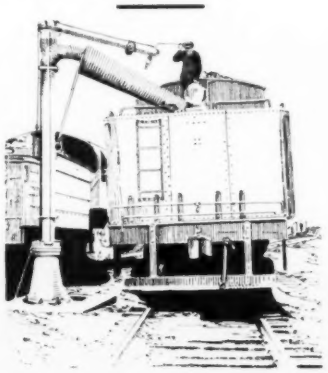
Claude H. Perry, retired division engineer of the Chicago & North Western, died on October 29.

Frank S. Weisbrook, general manager of the Davenport, Rock Island & North Western, and formerly roadmaster on that road, died on October 23, in Davenport, Iowa.

A. C. Tinsley, supervisor of bridges and buildings of the Norfolk division of the Norfolk & Western, with headquarters at Crewe, Va., was fatally injured in an accident at Farmville, Va., on September 30.

M. L. Fox, roadmaster on the Chicago & North Western, with headquarters at Norfolk, Neb., died of a heart attack on September 13.

Col. William J. Wilgus, former chief engineer of the New York Central, who conceived and directed construction of Grand Central Terminal, New York, died on October 24, at Claremont, N. H., at the age of 83.



Association News

American Railway Engineering Association

At a meeting of the Board of Direction held on November 8, the report of the nominating committee, which met on the same day, was received. An announcement of the nominations will be made as soon as acceptances have been received from the candidates.

The pamphlet giving the personnel and assignments of the various committees is to be mailed to members late in December. The November bulletin (483) was mailed late in November. This bulletin contains the reports of the committees on Economics of Railway Location and Operation, Water Service and Sanitation, Uniform General Contract Forms, Yards and Terminals, and Highways.

No meetings of standing committees have been scheduled for December.

(Please turn to page 1212)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 18-20, 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 14-16, 1950, Chicago. W. S. Lacher, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting April 25-27, 1950, Rice Hotel, Houston, Tex. H. L. Dawson, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Men's Association—E. C. Gunther, Secretary, 122 S. Michigan Avenue, Chicago 3.

Maintenance of Way Club of Chicago—Next meeting, December 19, 1949. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Walter L. Turner, Jr., Secretary, 30 Church street, New York.

National Railway Appliance Association—R. B. Fisher, Secretary; Lewis Thomas, assistant, Secretary 59 E. Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting, August 28-30, 1950, Brown Hotel, Louisville, Ky., Roy M. Edmonds, Secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 18-20, 1950, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago, 5.

Association News (Cont'd)

Wood-Preservers' Association

Under the leadership of President J. S. Giddings, plans are being perfected for the Forty-Sixth Annual Meeting of the Association, which will be held at the Rice Hotel, Houston, Tex., April 25-27, 1950. Among the features contemplated at next year's convention are a paper on Vapor Drying, by M. S. Hudson, Taylor-Colquitt Company, a paper on Pressure Treated Wood for Open-Deck Packed Chord Trestles, by H. J. McKenzie, chief engineer, Southern Pacific, Houston and a paper on Engineering With Treated Wood on the Missouri Pacific, by W. J. Burton, assistant to chief engineer, Missouri Pacific, St. Louis, Mo.

A special feature of the next convention will be a stopover at the Santa Fe's treating plant at Somerville, Tex., and a nine-day post-convention rail trip to Mexico City, Mexico, with a scheduled return to San Antonio, Tex. on May 6. Further details concerning the convention program and Mexican trip can be secured from Horace L. Dawson, secretary-treasurer of the association, 839 Seventeenth Street, Washington 6, D. C.

Metropolitan Maintenance of Way Club

Blair Blowers, chief engineer maintenance of way of the Erie, Cleveland, Ohio, will address the club at the annual luncheon meeting on December 8. This meeting will be held in the Skyline room of the Hotel Shelburne, Lexington avenue and Thirty-seventh street, New York, beginning at 12:30 p. m. and will take place on the same day as the annual dinner of the New York Railroad Club. All engineering and maintenance of way officers who plan to be in New York for the dinner are cordially invited to attend this luncheon.

Roadmasters' Association

Upon a call by President A. G. Reese of the association, the Executive committee will meet at the Chicago Engineer's Club, Chicago, at 9:00 a.m. on December 5. Based upon preferences expressed by members on return postcards furnished to them, the Executive committee will appoint the committee personnel for each of the various technical committees to make studies and reports during the current year. President Reese urges that any members who have not expressed their preference for committee work do so prior to the December 5 meeting.

Bridge and Building Association

President W. F. Martens has called a meeting of the Executive committee of the association in Chicago on December 12. The meeting, which will begin at 9:00 a.m., will be held at the Chicago Engineers' Club and will be occupied largely by the selection of personnel for the various technical committees for the current year. In order that the officers of the club may complete this selection of committee personnel, members who have not expressed their prefrence for committee work by returning the postcards sent to them, are urged to do so prior to December 12.

Maintenance of Way Club of Chicago

With another record-breaking attendance, the second fall meeting of the club was held on November 28 and was featured by a paper by President S. H. Shepley, assistant chief engineer, E.J.&E. describing, with the aid of colored motion pictures, the technique employed by his road in the preassembling of lap-lead ladders. The meeting was held at the usual place—Eitel's restaurant in the Field Building and was preceded by the usual reception and dinner. The next meeting of the club will be held on December 19, one week early than usual because of the

(Continued on page 1214)

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5 Washer nut stops seepage and locks through nail hole.
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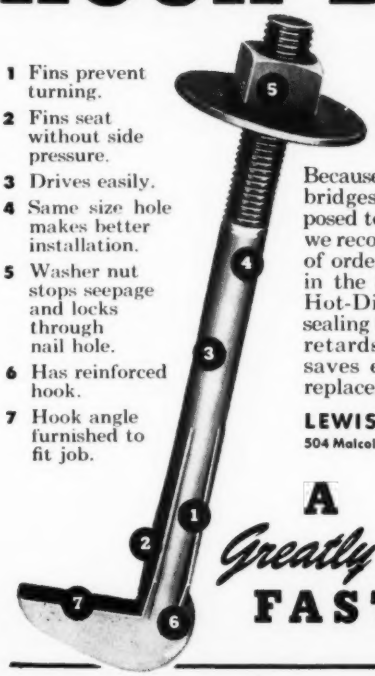

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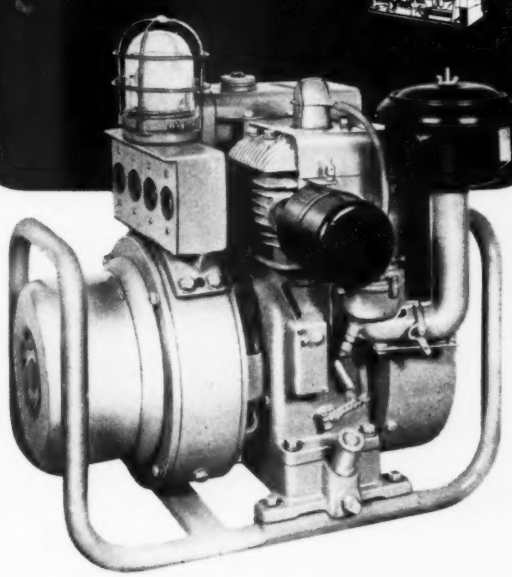

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Association News (Cont'd)

Christmas holidays, and will be addressed by G. M. Magee, research engineer, Association of American Railroads, on Causes and Cures for Wear and Splitting of Crossties.

Railway Tie Association

Announcement has just been made that the 32nd annual convention of the association will be held at the Brown Hotel, Louisville, Ky., August 28-30, 1950.

Supply Trade News

Personal

Ted H. Weigand has joined the **William F. Lynch Company**, general industrial contractors, Jersey City and Secaucus, N. J., as assistant to the president. For the past 27 years Mr. Weigand was associated with Ingersoll-Rand Company as field representative of the railroad department.

Russell A. Stevens, formerly Diesel department manager, Los Angeles (Cal.) branch, of **Fairbanks, Morse & Co.,** has been appointed manager of the company's Boston (Mass.) branch. He succeeds **V. O. Harkness,** who has assumed the duties of Diesel sales department manager for the Boston area.

H. R. Salisbury has been appointed president of the **Air Reduction Sales Company,** with which he has been associated for over 23 years in various executive capacities. The following vice-presidents also have been appointed: **H. F. Henriques** (general sales); **J. J. Lincoln, Jr.,** (railroad sales and sales services); **S. B. Stouffer** (distribution), and **N. L. Wisser** (field office management.

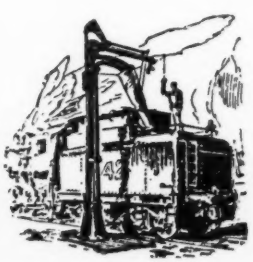
Eugene C. O'Connell, formerly service engineer in the Los Angeles (Cal.) branch of the **Independent Pneumatic Tool Company,** Aurora, Ill., has been appointed manager at San Francisco, Cal., and **Clarence H. Gabriel,** formerly service engineer at the Salt Lake City, Utah, branch, has been appointed manager at Denver, Colo.

Eugene P. Berg, general superintendent of the **Link-Belt Company's** Pershing Road plant in Chicago, has been appointed to the newly-created position of assistant general manager of that plant. **Richard Moyer,** superintendent of the steel shop at the Pershing Road plant, has been named general superintendent, manufacturing department of that plant.

The **Koppers Company** has announced the following changes in its production and research departments: **Fred Denig,** vice-president, appointed manager of the production department, succeeding **Hugh C. Minton,** who has resigned because of ill health; **G. Frank D'Alelio** appointed vice-president and manager of the research department, the position formerly held by Mr. Denig, and **A. R. Powell,** formerly assistant manager of the research department, appointed associate manager of that department.

The **Graver Water Conditioning Company** has established new sales and field engineering offices in the Hippodrome building, Cleveland, Ohio, and in the Commercial Trust Building,

(Continued on page 1216)



Supply Trade News (Cont'd)

Philadelphia, Pa. **Herman Ross,** formerly assistant manager of the Chicago district office is in charge of the Cleveland office, and the Philadelphia office is headed by **Robert Schenker.** The company also has announced the appointment of **Henry T. Sulcer** as general manager of the general offices at 216 West Fourteenth street, New York. Mr. Sulcer formerly was general auditor of the parent company, the Graver Tank & Manufacturng Co.

The **Pittsburgh Pipe Cleaner Company,** Pittsburgh, Pa., has announced the appointment of **Fred C. Morris** as manager of the newly-created subsidiary company, the **Pittsburgh Pipe Cleaner Company of California,** with offices at 119 New Montgomery street, San Francisco 5, Cal.

Obituary

F. J. Hood, president of the **Ansul Chemical Company,** Marinette, Wis., died at the St. Moritz Hotel in New York on November 10. Mr. Hood became associated with the company in 1927. He was elected vice-president and director in 1944, and president in 1948. He was 44 years of age.

Trade Publications

(To obtain copies of any of the publications mentioned in this column, use postcards, page 1151)

Shovel Cranes—The Link-Belt Speeder Corporation has published two 16-page illustrated catalogs on this company's shovel cranes. One of these describes a ½-yd. unit, the LS-51, and the other a ¾-yd. machine, the LS-71. The catalogs present the design, features and specifications of the shovel-cranes, and include numerous action photographs.

Bucking Snow Costs—This is the title of an eight-page illustrated booklet, published by the Caterpillar Tractor Company, which provides first-hand data and photographs on practical and low-cost snow removal with Caterpillar equipment.

Grouting Equipment—the Worthington Pump and Machinery Corp., has announced its Bulletin R-1700-B1, which presents the features of the Blue Brute Grout Mixer-Ejector, a unit designed to meet the specialized requirements of roadbed grouting operations.

Railroad Material Handling—The Pettibone Mulliken Corporation has published a four-page illustrated folder on its equipment for handling material on the railroads. The equipment described and illustrated includes conveyors, car unloaders, bucket loaders, buckets, ballast crushing plants, and the PMCO Speedloaders.

Structural Rib Bolts—The Automatic Nut Company, Inc., has published a four-page bulletin giving descriptions, applications, specifications, dimensions and weights of this company's structural rib bolts. These bolts have longitudinal ribs which deform when the bolt is driven into a hole, making a body-bound fit and locking the bolts into position.

Motor Cars and Work Equipment—Fairmont Railway Motors, Inc., has published a 40-page booklet completely describing, with specifications and photographs, the Fairmont line of motor cars, motor-car accessories, push cars and work equipment, the latter including ballast discers, derrick cars, extinguisher car, grouting outfit, spot board, oil sprayers, tie remover, tie sprayer, train order stand, weed burners, weed sprayer, and weed mower. The booklet is designated as Bulletin 625.

Lewis Products and Services—The Lewis Bolt & Nut Co. has issued a 76-page book, attractively bound in red board covers, cataloging the complete Lewis line of bolts, nuts, washers, bridge hardware, pole line hardware, rods, and upsets and forgings. The catalog also describes the special services offered by this company, including hot-dip galvanizing, pickling of steel products, electroplating, heat treating, drop forging, centerless grinding, bending and fabricating, hot and cold upsetting, and cold rolling and drawing.

ALPHABETICAL INDEX TO ADVERTISERS, DECEMBER, 1949

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Eliminate rail kinks, frozen joints, broken bolts, with . . .

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Let a Texaco representative explain this maintenance-saving method of rail joint lubrication in detail. Let him also tell you about additional maintenance savings through the Texaco method of asphalt-cement pressure grouting to stabilize "soft track," and the use of Texaco Asphalt for coating stone ballast to improve drainage.

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